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CONTENTS.

Original Communications.

PAGE

The Haya-Poison and Erythrophlæine. By Dr. L. Lewin 145
Glenwood Springs, Colorado, as a Health Resort. By A. Comstock, M.D. 149
Sulphur in Diphtheria. By H. Valentine Knaggs, F.R.C.S., L.R.C.P. 153
The Antrophor. By Dr. A. Bessard 155
Coca at Home and Abroad. By H. H. Rusby, M.D. 158
On the Treatment of Rheumatism and Neuralgia by the Electro-Vapor Bath and Massage. By F. E. Stewart, M.D., Ph.G. 165

Leading Articles.

Diagnosis and Treatment of Gastric Disorders 171
Hydrobromate of Hyoscine in Recurrent and Acute Mania, and as an Hypnotic. 173
Antipyrin during Labor 174
Jambul, Ortosyphon, and Euphorbia Drumondii 175

Reports on Therapeutic Progress.

Chemical Reaction of Acetanilide 170
Antiseptic Properties of Lanolin as an Ointment Basis. 176
The Reflex Inhibitory Action of Cocaine as a Diagnostic Factor 177
Treatment of Chronic Articular Rheumatism 177
The Liver the Excretory Organ for Iron. 178
The Use of Strychnine as an Hypnotic. 178
Half-Drachm Glycerin Enemata 179
Ovariotomy in a Child 179
Saponin and Sapotoxin 180
Treatment of Acute Blennorrhœa with Alkaline Injections 180
Coca Alkaloids 180
Impure Lanolin 181
Influence of Salicylic Acid on the Excretion of Uric Acid 181
Therapeutic Actions of the Fruit of the Myrobalan 182
Somniferin 183
Photoxylin in Perforation of the Tympanum 183
The Use of Calomel in the Prevention of Pitting in Smallpox 184
The Influence of the Pneumogastric Nerve on Urinary Secretion 184
Sodium Sulphibenzoate 185
Professor Sée on Diseases of the Stomach. 185
Hydrate of Amylene as a Narcotic 186
Transperitoneal Nephrectomy 186
A New Method of treating Pott's Fracture 187
A Case of Iodoform-Poisoning 188
Ergotin Injections 188
Medical and Surgical Treatment of Gall-Stones obstructing the Intestines 189
Resorcin in Sea-Sickness 190
Fuchsin in Albuminuria 191
Erythrophlæine 191
Dioxynaphthalin 192
Herpes Digitalis 192
Iodol in Otitis Media 192
The Treatment of Hypertrophy of the Prostate 193
An Antidote for Iodoform 195
Hypodermic Use of Salt and Water 195
Creolin in Cystitis 196
Pengawar Djambi 196
Antipyrin and Carbolic Acid 198
Successful Excision of a Tumor of the Spinal Cord 198
Iodine in Ascites 199
Hydrogen Peroxide as a Local Application in Diphtheria 199
Scopoleine and Rotoine 200
Benzoic Sulphide of Sodium as an Antiseptic 200
Incompatibility of Iodoform and Calomel 200
Hypodermic Value of Antipyrin 201
Berbemine and Oxyacanthine 201
Pilocarpine in Rheumatic Tetanus 201
Salicylic Collodium 201

Reviews

Reviews 202

Correspondence.

Berlin Letter 206
Paris Letter 209
Carbolate of Camphor 211

Notes and Queries.

Pure Narceine 212
Ulexine 212
Cocaine in Whooping-Cough 213
Composition of Sozoiodol 213
A Salve for Chilblain 213
The Saliva and Gastric Digestion 213
The Therapeutics of Headache 214
Reactions of Naphthol 215
Insect Stings 215
Management of Children's Teeth 215
A Case of Diabetes Mellitus 216
Formula for Cocaine Salve 216

Original Communications.

*THE HAYA-POISON AND ERYTHROPHLÆINE.**

BY DR. L. LEWIN,† BERLIN, PRUSSIA.

UNDER the name of "haya-poison" I received from Mr. Thomas Christy, of London, a small quantity of a dark brown, amorphous body, in small pieces, which was said to come from Africa. These pieces were convex on one side, and on the other had an indentation, which had the appearance of having been made by some sharp, angular instrument, which had been pressed into the substance. After a careful examination of these indentations, I came to the conclusion that they very likely were made by arrow-heads, from which the pieces had been taken off. My opinion was substantiated by my finding several marks of rust in the indentations, and further, by comparing the indentations with arrow-heads in the East and West African collection of the Ethnographical Museum of Berlin, and by finding that they had a similar angular point, and could be fitted into the indentations. The only positive information, however, that I was

* This article was sent us by the author in January last, but was received too late for insertion in our February issue.

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able to obtain regarding the poison was that it came from Africa.

Part of the poison could be easily pressed out between the fingers; the rest was darker in color and the lumps could not be cut, but split into pieces like aloes and were easily powdered. In both forms of the poison glittering spots were seen, which, upon examination after isolation, proved to be gold. It was, of course, impossible to determine whether the earth which had been used in the preparation or hardening of the poison had contained gold, or whether, as is said to be sometimes the case, the African compounders had intentionally mixed gold-dust with it.

The poison is odorless and tasteless, very hygroscopic, easily soluble in cold water, and still more so in boiling water. After filtration, a sandy, gravelly, glittering sediment was left. The watery, opalescent solution of the poison was found to contain a glucoside, as after it had been boiled with diluted acids it reduced Fehling's solution. Oxalic acid, picric acid, as well as tannic acid, cause a flaky precipitation in strongly acidulated solutions of the drug. Upon splitting up the precipitate caused by oxalic acid with baryta, I obtained a minute quantity of a brownish-yellow substance, which had an effect upon the eye of animals, and produced a sulphuric acid reaction, which I will refer to farther on.

Alcohol extracts active substances from pieces of the poison, and becomes light yellow. This is especially the case if the poison is treated with alcohol several times. The addition of a little water to such an alcoholic solution made it opalescent, and, after a little while, a colorless, amorphous, flaky precipitation appeared, which had no effect upon the eyes of animals.

After the alcohol had been allowed to evaporate, the residue was colored yellow. This was cleaned several times, and finally remained as a colorless, micro-crystalline mass, the crystals of which were insoluble in water. These crystals melt when subjected to heat, and recrystallize when exposed to cold.

They dissolve in ether as well as in alcohol. They do not act upon the animal body; they could be isolated by dissolving the residue in a little water and then filtering. What remained after the water had been removed was found to contain a little nitrogen, gave the glucoside reaction, and acted energetically, both locally and generally, upon animals. I would call especial attention to the fact that both the residue and its watery solution, as well as a solution of the poison, if dropped upon a porcelain dish, treated with concentrated sulphuric acid and heated until nearly dry, will give a light pink coloring.

After careful solution of all the poison in alcohol, there still remains a certain substance, which is soluble in water. This substance seems to contain poisonous properties, slightly differing from those of the alcoholic extract.

Ether does not extract any active substance from the poison. The residue which is left, after the ether has evaporated, is micro-crystalline.

So much for the chemical properties of the poison. I was precluded from making any further researches in this line on account of the small quantity of the drug which I possessed and the impossibility for me to procure any more. Regarding its toxic and pharmacological properties I am able to give more information.

When I began my experiments I resigned myself to possible disappointments, for I knew that it was only on extremely rare occasions that this poison ever came into the hands of foreigners, and my supply was of a very limited nature.

I had read in an old book of travels* that there existed a certain poison in the kingdom of Futa, in West Africa, that had caused loss of feeling and sensibility. Also Livingstone† speaks of a poison, which he met with at the Nyassa Lake and in the east of Africa, that rendered the tongue numb and powerless.

These facts had remained in my memory, and so soon after I had received the haya-poison I tried the effect of a watery solution of the same upon the eyes of animals. I was not a little surprised to observe that in every case the drug had an anæsthetizing effect similar to that produced by cocaine. This effect did not take place as soon as that of cocaine, but lasted much longer (from eight to ten hours), and very gradually decreased in intensity. Immediately after it had been dropped into the eye, it seemed to cause a slight irritation, which, however, only lasted for a short time.

Frogs, when injected with ½ or ¾ hypodermic syringeful of the poison, showed a marked decrease of the heart's activity. In some cases the reduction was from 30 to 8

* A New General Collection of Voyages and Travels. London, 1745.

† David C. Livingstone, "New Missionary Travels in South Africa." 1866.

pulsations in a minute; there was also paralysis of the extremities. This influence upon the heart's action also occurs analogously in warm-blooded animals. It is chiefly noticeable in the results it causes. In rabbits it causes especially an irregularity in the respiration. In twenty to thirty minutes after the administration of the poison the respirations become arhythmic, very frequent, short, jerky, and later, slower and dyspnœic. Simultaneously with these symptoms, a gradually increasing weakness of the animal is observed. The head falls forward to the ground, while the rest of the body still remains upright. The flow of saliva is increased. Then the head of the animal will begin to tremble, and it will fall over on its side, the legs become powerless, and, as soon as the breathing begins to be dyspnœic, most peculiar convulsions set in. The head is drawn down to the body, the eyes are spasmodically closed, and a convulsive wave runs over the muscles of the entire body down to the tail; the bowels also seem to be affected by it, but the limbs remain passive. Before this a loss of sensibility of the surface of the body may be observed. Death occurs usually without convulsions. If, instead of a solution of the poison, a watery solution of the residue left by the alcoholic extract be used, these convulsions will be more severe.

The watery solution of the poison when injected into pigeons caused continued vomiting, copious purging, the above-mentioned respiratory symptoms, and the bird dies during terminal convulsions, which only last for a short time.

Much larger doses than the above may be given to pigeons by the bill, and only cause continued vomiting and purging, or sometimes have no effect whatever. While both rabbits and doves were killed by .03-gramme (½-grain) doses of the poison given hypodermically, yet I have given .22 gramme (3½ grains) through the bill of birds, which, in spite of the vomiting, recovered.

According to the above, then, haya-poison is similar to other African arrow-poisons already known, and perhaps is identical with one of them.

The symptoms caused by the poison on animals reminded me of those which were caused by the arrow-poison of the Samoli people, the so-called Ouabaïo, and these, again, of the symptoms of poisoning following the use of erythrophlæum. But something else also led me to think of erythrophlæum, and this was the finding of minute pieces of bark, about half the size of the head of a needle, which reminded me of the bark of erythrophlæum, with which I had experimented thirteen years since. By comparative examination these minute pieces of bark proved to be nothing else than the bark of erythrophlæum. For this comparison I procured erythrophlæum bark from the Berlin Botanical Museum.

Now I had a groundwork from which I could start upon further investigations. Still, my discovery did not coincide with all I had previously ascertained concerning the poison. A local anæsthetical action is unknown in erythrophlæum, neither is there any reaction with sulphuric acid, such as I had discovered in the haya-poison.

Erythrophlæum Guineense (Don), *judiciale* (Procter), *ordale* (Bolle) or *Fillæa suaveolens*,* or *Mavia judicialis* (Bertol), "red-water tree." It is the Sassy bark, Tali bark, Teli bark, or Cassy bark of the natives of the Congo; N-ti-cassa on the Loango coast; the Cascar bark, or Ecorce de Mançone, of the Potugais, or Bourane of the Floups. I found that in the first part of this century the tree had been made mention of as being indigenous to the Congo in a description of the expedition of Tuckey.† In this work it was claimed to belong to the leguminous order, suborder Cäsalpiniaceæ, trib. Dimorphandreæ, genus Erythrophlæum Afz.

It reaches the height of forty to one hundred feet, has a reddish-brown, hard, gnarly, and broken bark, which is red under the epidermis. Leaves opposite each other; numerous sessile or very short-stemmed flowers, which are fragrant; a pod, which is two and one-half to five inches long and one inch wide, contains five to eight seeds, and is rounded off at the point. When fresh, the seeds are covered with a pulpa, but in the dry fruit scarcely a vestige of this remains. It is found on the west coast of Africa, Senegambia, Sierra Leone, Liberia, also in the upper part of the Niger, on the Gold Coast, on the borders of the Loango, in Lower Guinea, south of Angola in the Congo, in Central Africa, and, as my researches showed, also in the East, in Mozambique, and probably also in Somali, as the ouabaïo-poison, which is used there, is in some respects very similar to haya-poison,

* Guillemin, Perottet, Richard, "Floræ Senegambiæ Tentamen." Paris, 1830–32, tome i., tab. 55, p. 242.

† Tuckey, "Relation d'une expédition entreprise en 1816 pour reconnaitre le Zaïre, communément appelé le Congo. Trad. de l'Angl. Atlas." Paris, 1818, p. 35.

and shows the same properties. Besides this, haya and ouabaïo seemed to be very nearly related to one another.

The powdered bark is mixed with water or boiled, and is used on the west coast of Africa and near the Congo both as an arrow-poison and also in connection with their religious vagaries. The poison is given to persons suspected of some crime, and, if he vomits it, he is considered to be innocent of the charges laid against him; but if symptoms of poisoning set in, the poor victim is usually stoned, or killed in some other manner, before the poison has a chance to do its deadly work. It was observed* that a woman who took four tablespoonfuls of the powdered bark stirred in water did not vomit for half an hour, and not again until thirty minutes after.

The bark contains an alkaloid called erythrophlæine, which may be obtained as an amber-yellow, non-crystalline substance, which does not give any crystalline salts, but from which the hydrochlorate is prepared in powder form. This salt is soluble in water.

The only thing there was known about the poison was that it possessed, in addition to a cardiac action similar to that produced by digitalis, spasmodic properties.

Dogs are able to endure .01-gramme ($\frac{1}{6}$ grain) doses of the poison, but .02 gramme is a fatal dose. .001 gramme ($\frac{1}{64}$ grain) pro kilo. (15,432 grains or about 2 lbs.) of the animal's weight, has but slight effect.

In rabbits, doses of 1 milligramme ($\frac{1}{64}$ grain) cause the appearance of the cardiac symptoms; 5 milligrammes ($\frac{1}{12}$ grain) cause convulsions.

So soon as I was satisfied that the haya-poison contained pieces of the bark of erythrophlæum, I at once wrote to Mr. Merck, who very kindly sent me some hydrochlorate of erythrophlæum, and for which I herewith express my thanks; and then I awaited with eagerness to see what the results of my first experiments would be. My suspicions had not been groundless. A concentrated solution, say two per cent., contracted the pupils, and caused a loss of feeling of the eye, which lasted from ten to twenty-four hours. The irritative actions of the drug were, however, considerable. In cats, the use of this concentrated solution caused cloudiness of the cornea, salivation, running at the nose, and severe sneezing.

But a .25 per cent., .1 per cent., or a .05 per cent. solution of the hydrochlorate caused an anæsthesia of pupil, cornea, and conjunctiva of cats, rabbits, dogs, and guinea-pigs, together with a contraction of the pupil, which was analogous to that produced by the haya-poison. This action began in fifteen or twenty minutes, and lasted for several hours, and in some cases for as long as two days. The action is a purely local one. If injections of the drug be made in eyelids of animals, these will be rendered entirely insensible, and touching them does not cause any movement, whereas the eye itself will retain all its sensitiveness.

To give the reader a slight idea of the power of the drug, let me state that if a solution of .1 (1½ grains) to 100 grammes of water (3¼ ounces)—that is, 1½ grammes to 2000 drops of water—be prepared, of this solution 3 full drops dropped into the eye will cause anæsthesia. Thus the amount of hydrochlorate of erythrophlæine required to produce anæsthesia was only .00015 gramme (about $\frac{1}{600}$ grain).

If ½ to 1½ milligrammes ($\frac{1}{1000}$ to $\frac{1}{400}$ grain) of a .05 per cent. solution of the drug be injected into a guinea pig, it will give rise to such a complete insensibility of the surrounding flesh that the experimenter may cut deep into the muscles without causing the animal any pain whatever.

In frogs which have been given tetanus, an injection of erythrophlæine in a leg caused the spasms at once to cease in that limb, and it was impossible to create them again. The leg may be pierced through and through without causing the slightest reaction. If half a Pravaz syringeful of a .2 per cent. solution be injected into a frog, in fifteen minutes the insensibility at the place of injection will be so complete that, even if the spot be touched with concentrated sulphuric acid, or pressed with a red-hot needle, no pain will be felt by the animal.

I had cut myself with glass, and the wound was extremely painful, so I applied a few drops of a .2 per cent. solution, and the pain, which had been bothering me for a considerable time, ceased entirely in about ten minutes, and even severe pressure could not again produce it. This analgesia lasted for about an hour, at the end of which time I made a second application with a similar result. If the tip of the tongue be touched with the solution several times it will cause a most peculiar numbness.

The salts of erythrophlæine also give the reaction with sulphuric acid which I noticed

* Soyaux, "Aus West-Africa." Leipzig, 1879, pp. 216 and 221.

in the haya-poison. It is most singular that this reaction should have been overlooked by former experimenters with the drug.

I believe that I have proved beyond doubt the existence of erythrophlæine in the haya-poison, and although the quantity of the alkaloid contained in the poison is but small, I still feel convinced that the principal properties of haya-poison are due to its presence. The poison's property of causing "a loss of sensibility and consciousness," spoken of by the old chronicler, and its power of benumbing the tongue, of which Livingstone had heard, and further, also, the wide geographical distribution of the erythrophlæum-tree, from the east to the west of Africa, coincide in substantiating my conclusions.

Further, it is also possible, that besides the bark, the pods and seed-shells of the erythrophlæum are used in the preparation of haya-poison. I infer this from the dark coloring of those parts, which coincides with that of the poison. These, also, I found contain small quantities of erythrophlæine, but less than the bark. And so another link in the chain of evidence might be proved.

The leaves of the tree do not seem to be used in the poison, as I found no trace of chlorophyll in it.

Concerning the solutions of erythrophlæine, I would call attention to the fact that they opalesce easily, and, after standing for a time, will precipitate a flaky sediment, which is probably a decomposition product of the alkaloid, or, in other words, erythrophlæinic acid. For any eventual medical use of the solution filtration would be necessary.

Erythrophlæine is, however, a poison, and, apart from its truly wonderful anæsthetic properties, it also influences the heart, and therefore caution is necessary in its use.

But there is no reason for this fact to frighten any one from its use, and I think I can say of it, as of any other poison, that in experienced hands it may prove itself a blessing, while in inexperienced hands it might undoubtedly prove itself harmful.

Enormous quantities of erythrophlæum bark must exist in Africa, so that any possible future demand which the manufacture of the alkaloid may call for can be readily supplied.

In the year 1878 it was reported that erythrophlæum was among the plants that were sent from Liberia to London, from the utility of which the republic hoped to gain.

Also *Erythrophlæum coumenga*, or *koumango*, which is indigenous to the Seychelles, may contain an alkaloid which is identical with erythrophlæine.

Regarding *Erythrophlæum Adamsonia*, of tropical Africa and Australia; *E. chlorostachys*, *E. Laboucheri*, and *E. Fordii*, which Oliver discovered, further experiments are necessary to determine their value.

It now remains to be seen to what an extent the drug may prove itself to be of value to man. I will consider myself most fortunate if, by means of persevering and careful investigations, and by continuous and untiring research, the discovery will at last prove itself capable of helping the suffering and conquering pain.

BERLIN, January, 1888.

GLENWOOD SPRINGS, COLORADO, AS A HEALTH RESORT.

A PLACE OF INTEREST TO THE INVALID AND CONVALESCENT.

BY A. COMSTOCK, M.D., TOLEDO, O.

IT has been alleged that "earth has no sorrow that heaven cannot heal." It may be quite true, and may be otherwise. In a medical way, it is prognostic rather than diagnostic. We prefer to admit it, and yet it does not entirely satisfy. Most persons continue to seek relief in this life. The afflicted appeal to us now as ever before, and will hereafter till the causes be removed. The world is full of victims, and it is said not less now then ten thousand years ago: they are with us always, those with too much poverty as also too much wealth. The consumptive, the strumous, the cachectic of wide degree, all ask to be cured *now*.

We have healers of various sorts,—faith-healers, Christian scientists, metaphysicians, and a few physicians. Still, the tendency of the best authorities, and of modern thought generally, is to avoid isms and dogmas and search for logical sequences.

The vast majority of invalids are so surrounded and have such maladies that they are best attended to in the hospitals or their own home. There are, however, few practitioners that do not have some patients who would flourish best under different hygienic conditions, and are so circumstanced that they can afford to undertake a climatic change. It is to such that the following suggestions are addressed. At different dates and stages of our profession's history and the world's development we hear of various resorts,

mountains, plateaus, islands, pools, or springs as favorites in case of the comparatively fortunate ones who could indulge in the equipments and attendants requisite for such an enterprise. Central Asia, Northern Africa, Southern Europe, have, during the centuries, been prospected and catalogued quite thoroughly. The systematic development of such resources in behalf of our patients is quite recent, and due to new conditions.

The resources of this country are quite unknown, but destined to be investigated. An intelligent opinion will be appreciated by our own faculty and many in Europe, who already are sending inquiries. Indeed, the physicians of London send more patients to the mountains of Colorado and New Mexico than those of New York. The question, however, interests more people, by far, in the United States than elsewhere, because, although we have not an element which Europe assimilates and which in China is known as the "mandarin class," yet we have a much larger middle class who are intelligent, and are able and anxious to avail themselves of the best advice to be found in their behalf.

A week's tossing on ship-board is a life-long dread to many well people who otherwise would prefer to consult the best that art offers, and the varied climates of Europe, and to the sick it is a barrier more hostile than once was crossing the Alps. The question is a new one to us all, for it was not till within less than half a dozen years that our great fields of high elevations and mineral and thermal springs have become accessible. In fact, the first official report or classification of "Mineral Springs of the United States" has not been issued one year. The list covers a reference to between eight and nine thousand springs, all mineralized to some degree, but of these less than nine hundred have been analyzed, so that about nine-tenths remain to be classified in detail. Of thermal waters a wide range of temperature is found.

The Northwest attracts attention from its excess of geysers, or hot overflows. The output ranges all the way from a few thousand gallons to five millions per hour. Of all thermal springs reported upon to date, eighty per cent. is found in the uplifts and foldings of the Rockies and Sierras. The alliance between recent volcanic action and waters of high temperature is logical. It is fair to presume that *all* mineralized waters have their origin from a central hot-water source passing over rock-formations, which impregnates the fluid. The difference in temperature may be due to the cooling process which arises through strata intervening between the subsurface origin and its surface exit. Dr. A. C. Peale, the author of the report above referred to, comments as follows:

"The connection of hot and warm springs with volcanic rocks, with uplifted chains of mountains, and with dislocations or fractures of strata has long been recognized. Our Western States present all these conditions. Here are the most elevated portions of our country, and with the upward movement still in progress. A single glance at the general geologic map of the United States suffices to show that in this portion of our domain evidences exist of most intense volcanic activity, both past and present. Almost all the springs on our Alaska list are warm or hot, and in Alaska we find the volcanic forces still active. Alkaline, saline, chalybeate, and calcic springs are numerous; many of them are carbonated and still more are sulphuretted. Silicious springs, not prominent in other sections, are found abundantly in areas of hot springs."

Professor Shaler, in a recent article on "Caverns and Cave Life," has so clearly illustrated the natural history of thermal waters that it is difficult to improve upon his writing. "These hot springs," he states, "are in the main rain-water, which has penetrated to great depths below the surface, and become heated by the internal temperature of the earth; this rain-water is more or less commingled with the old sea-waters, which were built into the strata, through which it has passed in its slow underground journey. When in their upward paths they encounter deposits of limestone they rapidly enlarge the spaces through which they flow, making great chambers where the rock is soluble, connected by narrower fissures through the less soluble parts of the deposit. The solvent power of the water is in part due to the carbonic acid gas it obtained from the decayed vegetation before it started on its downward journey, and in part from the further contribution of this and other gases given it by the various decompositions going on in the heated depths of the earth. Springs of this nature are particularly characteristic of mountainous districts, where the strata lie at high angles. They are also found where volcanoes are, or have recently been, in action. In these depths the rocks are highly heated by the internal temperature. Partaking of this internal heat, the water passes upward, through any chance way, leading to the surface." Deep mining

has taught us many lessons, which impart a new light to the dynamics of underground structure. Not only the lime, but the iron, the sulphur, the soda, silica, and other elements which combine to make the various types of mineral waters, are taken up by the fluid *en route*, and two springs not many yards distant will have very unlike analyses because of a different line of exit in each. The therapeutic value of these springs may be observed from their topography, the character of the waters, and their altitude.

Glenwood Springs are found along the sides of the Grand River at its *débouchure*, after passing through a cañon of metamorphic rock half a dozen miles in length. They are just above the point where the Roaring Fork joins the Grand from the southeast, two hundred and nine miles above where the Grand enters the Colorado River in Utah, and one hundred and forty miles from Grand Lake, the river's source in Middle Park. The latitude is 39° 33′ north and longitude 107° 20′ west, and the elevation five thousand seven hundred and forty-three feet above sea-level. The Grand River here, as do most of the streams of Western Colorado, forms a valley of narrow limits, and is flanked by plateaus or table-lands from three to six hundred feet higher. White River plateau, which is the water-shed on the north, is about twenty-four miles away, and the water-shed to the south is Elk Mountains, half the above distance. Quite a roomy delta, fertile and of great natural beauty, is formed along the valley and opposite the juncture of the Roaring Fork.

Ten years ago, when Dr. Peale made his report of the Grand River district, he observed as follows: "We reached Rawlins on October 23, having been in the field just two months, nearly one-half the time being occupied in marching to and from and between our districts, on account of their remoteness from settlements." A few years before, Captain John C. Fremont passed the Continental Divide through Tennessee Pass, and down this river, on his way to the Pacific coast, at great peril to the entire party, and won enduring fame. To the invalid, able to walk abroad, as also to any one who has the leisure, it is one of the unique lessons in physical geography to saunter at will in any quarter of the compass one chooses to take from this point of observation. The elevations directly adjacent are easy of access, and if they become too facile, the more distant field is not barren of peaks which are liable to satisfy the vanity and ambition of almost any tenderfoot.

The natural history of these springs becomes more legible when we find ourselves at a point between twenty and thirty miles farther up the river. Near where the Eagle joins the Grand is a crest and basin of an extinct volcano, which at some time was the smoke-stack and escape to the fires which now heat the waters we find at Glenwood coming to the surface. The ash-pit covers hundreds of square miles, and below the town of Gypsum is a lava-bed of nearly pure silica and iron extending along the right bank of the river for one mile and back three miles to the foot-hills, with a thickness of from twenty to thirty feet. So recent has been the cooling that no tree or shrub appears along the black wave. There is a similar formation on the eastern slope of the divide, below Leadville, and about midway between it and Salida; and although the rains have brought down more drift and obscured it somewhat, the latter crater is an index to the source of the hot springs found at Poncho and Wellesville.

The product of the current at Glenwood is, by measure, four hundred thousand gallons per hour; the temperature averages 138° Fahr. The lime-rock along the bluff, a short distance up the stream, shows large openings or caverns which seem to indicate that an immense volume must have poured through the narrow gate when the river-bed was perhaps a hundred feet above its present level. The medicinal uses of these waters were recognized by the Indians, as also by the animal kingdom generally, which were co-ordinate with our predecessors. The steam arising from the surface guided to it from a long distance, and at all seasons and months it became a hospital to man and beast. The sediment which has accumulated for many yards about the outflows is still a favorite resort for cattle and horses which have a malignant form of hoof-distemper.

According to the law of Arago, the temperature of these springs would indicate that they took their origin about five thousand feet underground, or not far from the sea-level. I append the analysis of the Glenwood waters and that of the ocean, not because there is any physical connection presented, but as a matter of chemical comparison. The former is from the laboratory of Professor Chauvenet, Golden, Colorado, and the latter from Professor Dittmar, of the British service.

GLENWOOD MINERAL WATERS.

Constituents.	Grains per gallon.
Silica	2.06
Bicarbonate of iron	3.46
Bicarbonate of lime	46.48
Sulphate of lime	102.42
Chloride of magnesium	1.75
Chloride of sodium	1098.54
	1254.54

SEA-WATER.

Bromide of magnesium	4
Carbonate of lime	7
Sulphate of lime	85
Sulphate of potassium	50
Sulphate of magnesium	98
Chloride of magnesium	222
Chloride of sodium	1584
	2050

The percentage of solids in sea-water equals 3 5, and pure water 96.5 ; that of the Glenwood equals 2.3 solids and pure water 97.7. Sodium chloride is the chief constituent in both, while magnesium chloride is the lightest product of all the elements in the Glenwood Springs. The Sprudel Spring, Carlsbad, Bohemia, has three hundred and sixty-four grains of solids to the gallon, of which one hundred and fifty-seven are sodium sulphate and seventy sodium chloride. Hot Springs, Arkansas, has only eight grains and a fraction per gallon, but is the widest known and the most sought for in strumous cases of any resort on this continent. Among the hosts who avail themselves of the latter waters there is a very general impression that they contain some specific for syphilitic infection. Those who have bathed in the Glenwood Springs claim this result also, and, while access has been limited till of late, at times the valley has been a camping-ground for invalids, who have driven hundreds of miles in the canvas-top wagons to get relief.

The water certainly has a delightfully bland effect upon the skin and scalp, and a bath is a luxury to one in the best of health. It is not a pleasant water to drink, but positive in its results, both *via* the digestive tract and the kidneys, and should be used judiciously. It appears to be what the old writers call an "alterative," and may be classed among the list termed by Prof. Roberts Bartholow "agents promoting destructive metamorphosis, or increasing waste." The records of cases are perhaps not enough yet to be conclusive, and should be tabulated with more accuracy. I met an intelligent army officer, who came there a few months before me, suffering, as he supposed, from joint-rheumatism, affecting mostly the shoulder. He was a victim, since 1864, to a gunshot wound of the upper third of the humerus on the same side, which healed up duly. After using the baths for a few weeks a local inflammation set in near the original lesion, and a portion of bone came away, followed by granulation and closure. Since that time no further pains nor rheumatism have occurred.

Similar reports are related of long-standing injuries resulting in impaired circulation and innervation. From all the information to be secured, these springs ought to become, when suitably improved, an acquisition of great interest to those who desire to secure the best conditions of external treatment and the hygiene of climatic surroundings. Since the experimental teachings of Professors Tyndall, of England, and Langley, of this country, as to air-strata of different elevations, and the unprejudiced experience of the best observers in our profession, there remains no longer a question in reference to the utility of the dry altitudes of the interior of our continent. Dr. Charles Denison, of Denver, has, with great and patient detail, illustrated the peculiar and natural history of its effects, after a long-continued clinical comparison of recorded cases. Carlsbad, in a narrow valley, has an elevation of eleven hundred and fifty feet. Davos is confined in its area of about three times the altitude of the former. Hot Springs, Arkansas, has a bland, autumn climate, but slight elevation.

Asheville, N. C., is in the highest belt of the front range mountains and two thousand two hundred and fifty feet above tide-level, of which Dr. J. M. Taylor, of Philadelphia, writes, "I have been literally all over the United States, and, except Colorado, don't know a more perfect climate."

The "Glenwood Springs Company," whose secretary is Mr. Edsall, of that place, are of ample means and experience as to the requirements in such cases, and now are engaged in providing every facility that suggests itself in this enterprise. Other springs there are, and almost numberless apparently, but no place in the mountains at the present time seems so fortunately fostered, and none are of more promise. They may be reached by rail, without change, from Denver, Colorado Springs, or Pueblo in about twenty hours. The survey of the "Denver and Rio Grande" is *via* the Arkansas River to Leadville, over Tennessee Pass, and down the Eagle and Grand. That of the "Colorado

Midland" takes you through South Park to the Arkansas at Buena Vista, thence to Leadville, and down the Roaring Fork to Glenwood. By either route every mile of the journey has some new stimulant, and both are managed with great skill and no little consideration for comfort and elegance in transit.

SULPHUR IN DIPHTHERIA.

By H. Valentine Knaggs, F.R.C.S., L.R.C P., London, England.

THE remarkable antiseptic properties of sulphur have been recognized from the remotest periods. Homer refers to the use of this body as a disinfectant of undoubted value both in the Iliad and the Odyssey. In the writings of many of the ancient authors who followed after Homer similar allusions are made in much the same terms. From the time of Pliny to the present day sulphur has been used almost universally as a disinfectant, and has successfully withstood the test of ages. If this mineral had not possessed the germ-destroying virtues attributed to it, it would have long since been consigned to oblivion. When burnt in a room that has been occupied by a person suffering from any specific fever, it is generally preferred, even at the present time, to other disinfectants. By its agency contagia are effectually destroyed. The further spread of the disease is prevented.

Through atmospheric and other influences similar germs may accumulate to a dangerous extent in the human body, vitiating its secretions and diminishing or destroying its vitality. Contagious or infectious diseases, such as diphtheria, smallpox, whooping-cough, and others are now known to be produced through the instrumentality of bacteria, etc. These germs are given off with the secretions and exhalations of affected persons. Apart from the living body, we know that they can be thoroughly destroyed by the vapor or solution of sulphurous acid. *It is, therefore, reasonable to suppose that the appropriate administration of this well-known antiseptic (sulphur) would prove equally efficacious in disinfecting or destroying these same forms of lowly-organized vegetable life when they have become located in the tissues, fluids, and cavities of the animal economy.* This mineral slowly volatilizes, even at the ordinary temperature of the atmosphere, and emits nascent vapor of sulphur. This evolution takes place very readily indeed at the temperature of the human body. By such treatment the exciting cause of the disease is obviously removed.

The treatment of diphtheria by pulverized preparations of sulphur has been in vogue for upwards of thirty years. As far as I am able to gather, it owes its origin to a remarkable coincidence. About the year 1858 a number of French physicians were forcibly struck with the decided similarity existing between the vine-mildew and this disease. The vine-mildew was originated by the ravages of a fungus, termed oïdium Tuckeri. It caused great destruction among the grapes. The only known remedy to check its devastating course was the local application of powdered sulphur, which was blown freely over the diseased plants. Acting on the supposition that the diphtheritic deposit was caused by a kindred species of mildew affecting the animal kingdom, these physicians employed the same process of "sulphuring" in order to arrest the progress of this very fatal complaint. The success of the treatment would certainly lead us to believe that the resemblance was more than a passing one.

All European observers who have had any experience of this method of treatment speak decidedly as to the great utility and specific properties of this mineral in combating the ravages of diphtheria. Opinions are, however, conflicting as to the most appropriate manner in which it should be exhibited. A few words on the different methods that have from time to time been resorted to may appear apposite.

The forcible blowing of sublimed or precipitated sulphur directly upon the affected parts has still many votaries, and has probably been more resorted to than any other plan. The sulphur is projected into the throat either by means of an ordinary quill or tube, or by a properly constructed insufflator. Many of the older advocates of this process treated their cases almost exclusively by such means. Dr. Barbosa, of Lisbon, for example, subjected this plan of local medication to a thorough trial. He commenced his observations in 1867. In his memoir of 1874 he states that he has used sulphur successfully *in eighteen concurrent cases of laryngeal diphtheria.* In his practice he resorted to insufflations every three or four hours, or three times a day, according to the severity of the case. The application was not well borne at first, as it provoked cough and vomiting, but was subsequently renewed when this had subsided. More recently Dr. Schnyder employed

insufflations of sublimed sulphur on the plan recommended by Dr. Alb. Lutz, of Wurzburg, in 1870. Dr. Schnyder has employed this treatment *without a single failure for seventeen years.* He applied the insufflations every two, four, or six hours by means of a tube, blowing the powder freely over the parts. He considered the precipitated sulphur, or milk of sulphur, to be worthless, and thought it absolutely necessary to employ the sublimed form.

It will be readily acknowledged by those who have tried insufflation that it is a very unpleasant and trying process, especially for children and sensitive or nervous adults. There can be no difference of opinion relative to its employment in diphtheria affecting the nasal and upper pharyngeal passages. Its continued use in such cases may be regarded as absolutely necessary to complete a cure. When blown into the throat, however, it provokes cough, excites nausea, and even vomiting, while it at times greatly distresses the sufferer. Insufflation is a modified form of local application. The powdered drug is applied directly to the seat of the disease. The proportion that finds its way into the stomach is to my mind scarcely sufficient in quantity to effect very rapid improvement of the general febrile symptoms, which originate from the septicæmic condition of the blood. Indirectly by arresting the spread of the local mischief, the sulphur beneficially influences and impedes the further progress of this blood-poisoning. At the same time any further extension of the growth is prevented.

It is my firm belief that insufflations are of the greatest service in diphtheria. Previous records alone prove this. I do not myself employ them unless the posterior nares, or the nasal cavities, have become implicated by any extension of the fungoid growth from the throat. I have found the internal use of small doses of sulphur suspended in a viscid mixture to answer every purpose, with the least possible amount of distress to the patient, and with equally uniform certainty. If administered at very frequent intervals, and slowly swallowed or sipped, such a mixture plays the same part as the insufflated powder. It clings to and acts upon the leathery growths in a like manner. The mixture can be taken in any quantity. By its absorption into the system the febrile symptoms are rapidly allayed, and the contagia present in the blood and tissues of the body effectually destroyed.

Local applications containing sulphur suspended in water and various menstrua have been resorted to on various occasions to destroy diphtheritic growths. Remedies of this kind are either applied topically to the affected parts or used as gargles.

Henry Meymott, medical officer of the Ludlow Union workhouse, writing to the *British Medical Journal* in 1881, says that "the local application of sulphur has proved its efficacy in an epidemic of diphtheria in the workhouse. The benefits thus obtained locally may be assisted by the internal administration of the drug as an assistant purifier of the blood."

The employment of sulphur gargles has been a very favorite form of treatment for many years with the non-medical world in Great Britain. A teaspoonful of the flowers of sulphur is stirred up in a wineglassful of water, and the throat repeatedly gargled with the mixture. With respect to the use of sulphur in this manner the following statement is certainly a remarkable one. It went the round of many of the English weekly periodicals about the year 1878. I extract this from the "Scientific and Useful" column of the *Family Herald:*

"A few years ago, when diphtheria was raging in England, a gentleman accompanied the celebrated Dr. Field on his rounds to witness the so-called 'wonderful cures' which he performed, while the patients of others were dropping on all sides. The remedy to be so rapid must be simple. All he took with him was flowers of sulphur and a quill, and with these he cured every patient, without exception. He put a teaspoonful of flowers of brimstone into a wineglass of water, and stirred it with his finger instead of a spoon, as the sulphur does not readily amalgamate with water. When the sulphur was well mixed he gave it as a gargle, and in ten minutes the patient was out of danger. Brimstone kills every species of fungus in a man, beast, and plant in a few minutes. Instead of spitting out the gargle, he recommended the swallowing of it. In extreme cases, in which he had been called just in the nick of time, when the fungus was too nearly closing to allow the gargling, he blew the sulphur through a quill into the throat, and after the fungus had shrunk to allow of it, then gave the gargle. He never lost a patient from diphtheria. If a patient cannot gargle, take a live coal, put it on a shovel, and sprinkle a spoonful or two of flowers of brimstone upon it; let the sufferer inhale the fumes, and the fungus will die."

The internal administration of sulphur was much resorted to by the pioneers of this treat-

ment. It was often used in conjunction with insufflation. The usual plan adopted consisted in giving one large dose, which was repeated if necessary. Dr. Duché, for instance, employed this medicine internally in this manner in 1858, and advised its use as a preventive among non-infected persons. Dr. Lagauldin, another French observer, several years afterwards gave "a soupspoonful of sulphur sublimatum mixed with a little water."

Six years ago, in conjunction with my father, I began to use sulphur as a remedy for diphtheria. It was at first given in the various ways that have from one time to another been recommended. During this period of time seventy-five cases have been treated solely by this drug in our practice. In no instance did a fatal termination occur. Complications and sequelæ also were but rarely noticed. An account of these results was published in the *Provincial Medical Journal* in 1885, and I subsequently brought out a small pamphlet on the subject. In this brochure I endeavored to set forth a short account of the prior history of this method of treatment, and described the particular mode of administration that I hold to be the best suited to this complaint.

It is far from my intention to decry in any way the judicious employment of insufflations, gargles, and maximum doses internally. I have, however, come to the conclusion from practical observations that the most uniform results are to be obtained by the use of small doses given at frequent intervals.

It has been my endeavor to find a suitable vehicle for the exhibition of this remedy. Water can hardly be considered to answer our requirements because of the rapid subsidence of the particles. Mucilage, with or without syrup, appeared to answer well as a menstruum, but the mixture decomposed in the course of a few hours. For preparing the sulphur mixture glycerin will certainly be found the most satisfactory body to use. This fluid is antiseptic. One part to ten of water is stated to preserve animal substances equal to spirit. A mixture made with glycerin keeps well. This addition, according to my belief, greatly enhances the efficacy of the sulphur. The formula that I now use by preference is as follows:

Precipitated sulphur (pure), ʒiss;
Chocolate powder, ʒi;
Cinnamon-water (concentrated 1 in 40), ℥i;
Glycerin to make ℥iii.

Mix the powders together in a mortar, then gradually add the glycerin, with constant trituration, and lastly the cinnamon-water. If kept in tightly corked, sealed, or stoppered bottles, this preparation will keep well for a very long time. It of course requires shaking before use. The mixture is remarkably palatable, and is readily taken both by children and adults. Each drachm contains about three grains.

Sig.—½ to 1 teaspoonful to be taken every hour or oftener. The dose should vary according to the age of the patient. The mixture ought to be continued for at least five days, but at less frequent intervals after the severity of the symptoms has abated.

189 Camden Road.

THE ANTROPHOR.

A NEW INSTRUMENT FOR THE TREATMENT OF DISEASES OF THE MALE URETHRA, THE UTERINE CANAL, THE NASO-PHARYNGEAL SPACE, THE LACHRYMAL DUCT, OF FISTULÆ, AS ALSO OF GUNSHOT AND STAB WOUNDS.

By Dr. A. Bessard, Dallas, Texas.

IN looking over the literature of the last three years on the treatment of gonorrhœa, we notice that there exists a tendency against the time-honored injections into the male urethra.

Several new methods have been advised for the purpose of bringing the medicaments into the urethra, especially its deeper parts, in such form and manner that they may remain in contact with the diseased mucous membrane for a longer period of time.

There are, first, the medicated gelatinous pencils. These, however, lack sufficient firmness in cases of obstruction by pus, swelling of the mucous membrane, or when deviations have to be passed.

Unna (*Monatschrift für Pract. Dermat.*, 1885) recommends tin sounds covered with a stiff mass of a nitrate of silver ointment. He, however, does not rely on this means only, but combines it with injections. Besides, these sounds can only be of service during the chronic stage of gonorrhœa.

Mr. Vail (*Brit. Med. Journ.*, 1885) invented an open wire bougie. His contrivance is made of three wires soldered together at one end and bent into the shape of a sound. This instrument is intended to keep separate the inflamed mucous membrane of the urethra, and to allow the discharge to drain freely away. Another form has instead of the flanged extremity a short length of catheter tube attached, and to that a short

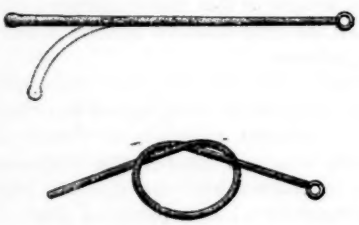
piece of rubber tube. The solution to be injected is introduced by a syringe, and when quite full the india-rubber tube is compressed by a spring clip to prevent the escape of the fluid. He retains the fluid for from twenty to thirty minutes

In certain cases and at certain stages of disease these open bougies are certainly of practical value.

O. D. Ball (*Med. Record*, July 24, 1886) applies zinc ointment into the deep urethra by means of olive-pointed bougies. This is, no doubt, an excellent means in certain chronic cases.

Casper (*Berlin. Klin. Wochenschrift*, 1885, 49) recommends grooved sounds (*Kannelirte Sonden*) charged with nitrate of silver ointment.

Reviewing this armamentarium, and comparing these contrivances with the antrophor, the invention of Dr. Paul Franke, of Chemnitz, Saxony, we first of all notice one point in favor of the latter,—namely, its being suitable in all forms and stages of gonorrhœa, while all the others can only be introduced under certain conditions and during certain stages of the disease.



The antrophor consists of a spiral tube, formed by a closely-wound coil of wire, to one end of which is fastened a small rivet with a hemispherical head, while the other end bears a ring to serve as a handle. These are both neatly soldered in position. Having no core, the spiral tube possesses greater elasticity and pliability, yet will stand very firm when pushed straight. These tubes or skeletons are coated with a thin film of shellac to protect them from oxidation or the action of chemicals used in the medicaments. To a solution of gelatin and glycerin, in such proportion that its melting-point is 82°, are added two per cent. of carbolic acid to secure aseptic condition, and finally the medical agents in various doses suitable to the cases to be treated. Into this composition the skeletons are dipped at a temperature of 86°, then they are suspended by the small handle, becoming hard by cooling. These operations are repeated till they have taken the requisite amount of material. While suspended in a vertical position a drop-shape swelling is produced. In order to prevent the finished antrophors from adhering together, they are dusted with talc, which must be washed off with cold water before application. By this moistening the gelatin becomes lubricated and ready for introduction.

The pliability of the hollow spiral permits it to enter all, even tortuous or choked-up, channels without causing irritation, and to accommodate itself to varied shapes.

While the antrophor thus acts as a carrier of medicaments into cavities (ἄντρον, a cavity; φορεῖν, to carry), it may at the same time be employed as a sound of great value, its pliability and its firmness being at the surgeon's command and control.

The antrophor is to be retained in place for a period of from ten to thirty minutes, so that the medicated preparation may liquefy slowly and remain in close contact with the diseased portion of the urethra, or the walls of the fistulæ, or wounds, or cavity, whichever the case may be. The patient has to observe absolute rest while occupying the recumbent position as long as the antrophor is retained in the urethra.

From this description can be seen the utility of the antrophor in the diseases of the urethra, the uterine canal, the naso-pharyngeal space, the lachrymal duct, in fistulæ, and stab and gunshot wounds.

Concerning the use of the antrophor in intra-uterine treatment, Professor Winkel, of Munich, says, "This new method to have medicaments act on the inner surface of the uterus is a clever invention and very commendable. Injections are not retained long enough; pencils break off too easily; powder projected into the uterine cavity acts too unequally. The antrophor has none of these drawbacks. When coagulation of secretion exists a number of antrophors are applied in succession, and the medication directly on the mucous membrane can thus be secured even under these circumstances. As a special advantage of the antrophor I wish to mention its pliability, by means of which its adaptation to the inner surface can be secured in every direction, as also introduction to the very fundus."

The antrophors which I have applied were those charged with thallin, iodoform, silver nitrate, lead acetate, bismuth subnitrate, and cocaine.

My attention was called to the new drug

thallin by some articles which appeared in the *Correspondenzblatt für Schweizer Aerzte*, 1, 1887, giving the experiments of Dr. E. Kreiss on the effect of the thallin sulphate on gonococci, and the experiences of Dr. Goll in the treatment of gonorrhœa by means of thallin sulphate, and more recently by a paper of Dr. A. Rose, of New York, which appeared in the *New York Medical Journal*, October 22, 1887, in which he says, "According to Kreiss's experiments, published in January, 1887, thallin is the very specific against gonococci, and perhaps the long-searched-for means for abortive treatment. In a case of acute gonorrhœic inflammation I first tried an injection of a weak solution of thallin, but found it caused too much pain. Then I tried an injection of pure cold water, and found that that likewise gave pain, rather more than the thallin injection instead of less. I then introduced an antrophor charged with a five per cent. thallin mass, and to my surprise found no difficulty and caused no pain whatever. This case was a very severe one, characterized by extensive lymphangitis, with fever, unusually painful micturition, and nocturnal erections. It appeared to me that the thallin antrophor did more service in alleviating all these symptoms and shortening the process than any treatment I had ever employed or heard of."

I have found Dr. Rose's experience confirmed, and am convinced that the thallin antrophor is a most excellent remedy in acute and subacute gonorrhœa, surpassing all others which I ever became acquainted with. There is certainly no other method of treatment so free from irritation. This non-irritation is the most essential feature which we demand from a means to be employed in the very acute stage of gonorrhœa where the inflamed parts are keenly sensitive.

Next to thallin I have had most satisfactory results from acetate of lead in subacute gonorrhœa. I found this the best means to control the abundant discharge. One application of acetate of lead antrophor was of more service than a number of injections made at intervals of ten hours. Likewise acted the bismuth antrophor.

In summing up, I say that the application of the antrophor is free from many dangers and drawbacks of the urethral injections. As we have seen, the antrophor can be used in the very initial stage, when injections are out of question on account of the irritation they cause.

The antrophor is milder, less irritating, less unpleasant, and at the same time more effective than injections.

In acute and subacute urethritis the length of seven, ten, fourteen, or eighteen centimetres (these are the measures in which they are in the market) may be indicated, according to how far into the urethra the inflammatory process is extending.

The uterine canal, the female urethra, the naso-pharyngeal space, the lachrymal duct, require antrophors of only seven centimetres length.

Fistulæ and wounds according to individual cases.

As we are aware, the cause of all trouble in gleet are gonorrhœic ulcers covered with granulations, situated in the deep urethra, sometimes in the shape of a ring, occupying the whole circumference of the urethra. We are also aware how these granulations obstinately resist all kind of injections for months and years.

To reduce such obstinate granulations, Dr. Keyes, of New York, uses a modification of Ultzmann's long-nozzled syringe, by means of which he instils a few drops of a saturated solution of nitrate of silver into the prostatic portion. This procedure, even in skilful hands, is not free from danger, as Dr. Keyes has to confess himself.

A very few antrophors, charged with a two per cent. nitrate of silver mass, sometimes one only being required, will promptly heal such ulcers and granulations.

There is no other means which can stand comparison with the antrophor in such cases, especially in regard to safety, facility, and certainty.

If there are only ulcers, or if the case is not of too long standing, iodoform antrophors may answer.

In all chronic cases—that is, in those in which the prostatic portion of the urethra should be reached for topical treatment, be it by nitrate of silver or by iodoform antrophors—these antrophors have to be of the length of twenty-two centimetres.

The same kind—that is, of the length of twenty-two centimetres—charged with milder or stronger masses of nitrate of silver have been recommended in cases of spermatorrhœa and impotency. Chronic prostatitis will be benefited by iodoform anthropors of the mentioned length.

17 Live Oak Street.

*COCA AT HOME AND ABROAD.**

By H. H. Rusby, M.D., New York.

I.—COCA AT HOME.

THE appropriateness of the title which has been selected for this series of papers will appear in what follows. It was suggested by the observations of the writer during a residence of several months among the coca plantations of Northern Bolivia, by which it was established that coca at home and coca exported are drugs essentially distinct. The conclusion will not seem strange to those who have followed, even superficially, the history of the drug.

More than three hundred years ago the intelligent priests and noblemen who visited Peru brought home specimens of the coca plant, accompanied by accounts of its remarkable power in enabling the Indians to undergo, without suffering, the long and terribly exhausting journeys across the high and steep Andean passes. The material which they brought home was tested, and found to be destitute of the properties attributed to it. Its use was thereupon condemned as a pernicious vice, and through the influence of the home authority everything was done by the priesthood in Peru to discourage its use among the people. This action was the more willingly taken by them because of the relations of coca-chewing to the heathen rites of the people. But those who continued impartially to watch its effects became convinced that its use was judicious, and the subject was again investigated, but with the same result as before. The three centuries that have since elapsed have covered a series of never-varying repetitions of this experience. Its native use has been investigated by Humboldt, Poeppig, Von Tschudi, Markham, Smith, Orton, D'Orbigny, Squires, and other distinguished scholars who have explored the Andes, and not one among them has failed to become convinced of the genuineness of the claims concerning it. Some, like Squires, have taken pains to investigate its practical effects by specially-devised tests, and the results have always been affirmative. Not a few enterprising houses in this country and Europe have sought for some preparation which would embody the desired property. But every preparation made from the dried exported leaves has been found nearly inert, as regards the characteristic stimulant action of the drug. It may be said that these repeated trials have been thoroughly convincing to the profession at large. The feeling of disappointment has been rendered still more complete by the results of trial with some preparations claiming to be made from the green leaves, but in reality containing none at all, or not sufficient to constitute any material difference in the product. When at length cocaine was discovered, hope was once more renewed, and it was generally supposed—in fact, declared—that we had located the mysterious property. In the *Wiener Medicinische Presse* for August 9, 1885, the writer discusses the strangeness of this long inability to discover the alleged properties of so important a drug, and seeks for an explanation in impure methods of manufacture. But it is not necessary to say that such is not the case. The real cause is quite different. With certain reservations, it may be said that the properties of cocaine, remarkable as they are, lie in an altogether different direction from those of coca as it has been reported to us from South America. To discuss the nature of these differences is the object of my papers.

By long and patient investigation I have established to my own satisfaction the fact that recent coca-leaves possess all the properties that have been so long attributed to them by the natives who make daily use of them.

In the present number I shall give an account of the uses and properties of the plant where grown, as observed by myself, and reported by those who have studied it there, and of its chemical behavior under my own experiments. For additional information on the subject I refer the reader to my article in the January number of the Therapeutic Gazette for 1886, p. 14. A complete account of the history and uses of coca, and the estimation in which it is held, is of fascinating interest, involving an account of the domestic habits and customs, as well as the religious and political history of this people. But we can here present only the practical considerations which are suggested.

There probably does not exist a domestic remedy which is so largely used, and with such good results, as are coca-leaves. It is because of its valuable properties that the plant has come to be regarded as sacred by a superstitious race, who see no natural law in the action of drugs, attributing all to the work-

* I am under great obligations to Señor Don Manuel Zavala, a distinguished Spanish gentleman, residing in Yungas, Bolivia, through whose kindness in placing facilities for study at my disposal my investigations were rendered possible.

ings of magic. These superstitions and heathen ideas served to disgust the Spanish missionaries, and led them to hold the entire use of the plant in disrepute, which disrepute has been bequeathed to us. So far as its religious interest is concerned, it has never been truly worshipped, notwithstanding that Dr. Hippolita Unnane says of it, "The shrub which produced the leaves and gloried in the possession of the name was considered, in the age of the empire of the Incas, a living manifestation of divinity, and the place of its growth a sanctuary where all mortals should bend the knee." But its use has always been sacrificial, and among the interior and unconverted tribes this use still obtains. This religious element has served to blind its subjects to the real effects of the drug, so that it possesses more or less repute for a great many purposes which are manifestly absurd. From all this it is necessary to search out by actual observation and good judgment those uses which are really warranted by its effects.

Its properties are stimulant, supporting, carminative, sialagogue, expectorant, aphrodisiac, and emmenagogue, and locally and generally anæsthetic. The term stimulant is here used in a very general sense, and covers a number of effects peculiar to this drug, not least of which is its effect on the mind. To apply these properties to the uses of the plant, and say which of those uses are intelligent, and to explain the manner in which it produces some of its effects, is no easy task, and one that is undertaken in a somewhat tentative spirit.

Of all its uses the most important is that of a stimulant, to understand which the reader must know something of the conditions under which it occurs.

Upon the Bolivian plateau we have a vast population of Aymara Indians, who subsist by agriculture, grazing, mining, and transporting goods across the mountains. The special adverse conditions of their existence are exposure to cold and sudden changes, a greatly rarefied atmosphere, excessive and long-continued exertions, and a very limited food-supply. The Indian declares that he would be unable to meet these conditions successfully without the aid of coca, and I believe that the historical evidences are sufficient to support the assertions. The Aymara's means for battling with the physical world have been greatly straitened by his persecutors. The world's history furnishes no parallel of cruel oppression. Whatever scanty possessions he has wrung from the avaricious grasp of that desert region have been stripped from him by his conquerors. To this day we see there the paradox of a people who constitute at the same time the laboring class and the tax-paying community. I cannot wonder that some of my statements concerning the life of these people have been looked upon as exaggerated, but I can only reiterate them in the simplest manner. As the traveller, muffled in furs and woollens, rides across the wintry waste, his Indian boy trots along at his side, frequently through banks of snow, bare to the knees, or, at the most, protected by a pair of simple sandals; and, while the former is sleeping beneath a burden of blankets in a stone hut, the latter is shivering outside, with only a single thin and ragged blanket to protect him from the piercing winds which sweep across a plateau fourteen thousand feet above the level of the sea.

The hired shepherds, whose wages are next to nothing, know no habitation, go barefoot, and sleep almost wholly unprotected. Fire is out of the question, as the fuel of those summits is sufficient for only the most necessary cooking purposes. The standard food of these people is quinoa, the seed of *Chenopodium quinoa* L., having somewhat the appearance of very finely-broken sago, and, when cooked, the consistency of oatmeal, with the flavor of spinach. When travelling so as to be unable to cook, he subsists on raw or parched maize. Even of these simple elements he has not enough, and he is almost always hungry. On their frequently-recurring journeys as couriers, when little food can be carried, they often go for days almost without eating and subject to the most exhausting labor that is conceivable. The regular allowance on these rapid journeys is said to be not more than two pounds of parched corn for one hundred Spanish leagues. Under such circumstances the struggle for existence would seem severe enough even if life were inactive. But these poor creatures are obliged to carry heavy loads for such distances as seem incredible. The standard load for a *cargador* over the worst of the Andean passes is sixty-five pounds. The element of sorocho is the most important one in this consideration. It is an affection caused by high altitude, the prominent symptoms being headache, nausea, and muscular weakness. The headache caused is very similar to that of acute meningitis or typhus fever. Its pathology is not known, but its causation is probably to be found in the expansion of the hæmatic gases, due to

light atmospheric pressure, by which the corpuscles become enlarged and clog the capillaries, resulting in congestions of all the important organs, so that in addition to the small percentage of oxygen per volume of air, we have a congested state of the respiratory organs, the muscles receiving only a minimum amount of oxygen and exhibiting a minimum degree of strength. To this condition the Indian becomes more or less accustomed, the lungs and the muscles being extensively developed; yet, in passing from a low to a high elevation, he is never free from annoyance, and oxygen starvation is his constant foe. These conditions must be fully considered if we would understand the stimulating and supporting effects of coca-chewing, for by it they are directly combated.

The great difference between native coca and other drugs of its class is that its effects do not greatly diminish with continued use. What it does for the Indian at fifteen it does for him at sixty, and a greatly-increasing dose is not resorted to. There is no reaction, nor have I seen any of the evil effects depicted by some writers and generally recorded in our books. In this position I am not alone. Garcilasso, Von Tschudi, and Markham all speak with incredulity of the evil effects of coca-chewing, while Mr. Archibald Smith declares that such instances must be very rare, as, after living for years among people who habitually use coca, he had never seen a single victim (Brit. Encyc.). I myself mixed for nearly a year among a million people who use coca daily without ever seeing a single case of chronic cocaism, although this one subject chiefly occupied my attention, and I searched assiduously for information. Reliable citizens informed me that they had heard of Indians who had presented the terrible symptoms of which we read, while others denied their existence, declaring the only evil effect to be the loss of the sense of taste, which became noticeable in the case of cooks. These people have been described as "weak, puny, and intellectually little above the beast." So far as this applies it is a race peculiarity, and it is the more remarkable that such a people should perform daily tasks during long lives, which would quickly destroy our finest athletes. I believe that cases do exist where coca chewers become intemperate, carrying the habit to a point where it becomes ruinous, but it is certainly true that the cases are so rare as to be almost unknown, and the result is doubtless due to constitutional peculiarity or predisposing disease. Cases of extra need are customarily met with an extra supply of the leaves, and the desired effect is always promptly obtained, but on the cessation of the unusual demand the consumption at once falls back to the accustomed amount. In cases of excessive exertion and exposure the Indian uses coca without any limit except his own appetite, but in all such cases I have seen that, the period of strain successfully passed, he enters smoothly and quietly upon his period of rest, eating enormously, but digesting with perfect satisfaction. In carrying a patient through a serious illness and during convalescence the same recourse is had to coca, but generally in the form of decoction or other fluid extract.

Living in the region of coca-chewing one accumulates great stores of evidence on the subject. Some of the illustrations are quite striking.

During the great rebellion about La Paz in 1781, when the besieged inhabitants were reduced to starvation, the survivors were almost wholly the consumers of coca.

It is observed that when through poverty or other cause a foreigner is obliged to work beside the Indian laborer, he usually finds himself unable to do so with comfort until he resorts to the use of coca. Afterwards he usually abandons its use, although one of my men, an American, contracted a habit, and, American-like, indulged it to excess.

The better classes, of course, do not indulge in the habit, although I fancy that there are but few of them who do not resort to it at times; and all are ready to testify to its prompt effects in returning the exhausted hunter to the chase, or enabling the weary and belated traveller to hasten his steps towards home.

A portion of the results here considered are doubtless due to its anæsthetic effect on the stomach. The exhausting effect of hunger, and consequently of labor accompanied by hunger, is not wholly due to a lack of nutrition. The first evil is the nervous waste produced by the endurance of hunger's pangs. In my own case I have had abundant opportunities for verifying this principle. These pangs are absolutely allayed by the use of coca-leaves. It allays hunger and thirst completely, and thus supports the traveller by removing the chief source of his fatigue. This is a most important action; but I believe that in no other way can the drug be considered as a "preventer of waste," as we so frequently hear it called. The expenditure of force is possible only by the consumption of energy,

and energy implies waste. But through bad nervous conditions energy may be consumed without the production of any useful force. This loss coca tends to check through the agency of its cocaine. Thus, by alleviating pain, it leaves the system free to secure the utmost benefit from vital action.

But this is by no means all. It produces other effects of a far more positive character. The effect of chewing the native coca-leaves is to diminish the frequency of both pulse and respiration, at the same time increasing their strength, and particularly the depth of the respirations, to a remarkable degree. To ascertain if this result were due to the action of the cocaine, I made a fluid extract of freshly-dried leaves, extracted the cocaine, and evaporated down the residue to the consistency of boiled molasses, and obtained from it the same effects in a marked degree. A remarkable depth and strength of the respiration and an abnormal expansion of the chest were observed, accompanied by a slight sensation of drowsiness. By thus deepening, strengthening, and regulating the respiration, it secures the greatest amount of oxygen with the least expenditure of force, and so provides the Indian with a special defence against a second of his powerfully adverse conditions of life. Professor Wm. H. Thompson, in his admirable lectures before students, is wont to dwell on the great importance of oxygen as the muscle food, and may almost be considered an apostle of rational methods of oxygenation. But, in general, we hear far too little on this point. Eradicate from the diseases of our patients the element of atony of the muscles of the heart, lungs, and intestines, and the feelings of languor, which prevents their properly exercising the voluntary muscles, and a great burden of care would be at once removed from us. This is merely a question of oxygen and its perfect utilization, in securing which the Indian finds in coca leaves an agent without a parallel.

I now pass on to some of the less celebrated, yet important, of the domestic uses of this drug.

First, in digestive trouble. It is a great digestive tonic, notwithstanding that it temporarily decreases the appetite. Hence its universal use after, rather than immediately before, eating. No greater error could be made than the exhibition of any preparation of coca before eating, because of the loss of appetite which succeeds, and which persists sometimes for a long period. Its depressing effect, however, seems to apply to the appetite alone, for, the food once ingested, coca acts as an aid to digestion.

There are two conditions in which the internal effect of coca-leaves is quite as magical as the local effect of cocaine. First, in case of the discomfort or pain resulting from overeating, or from habitual dyspepsia; second, in true colic, particularly that of infants. In the case of adults, its use in such cases is usually in some form of fluid extract. In the towns this is usually an alcoholic extract, obtained from the shops. In the case of infants, it is prepared by stirring a few leaves in warm milk. Chronic digestive troubles of long standing are frequently cured by the habitual use after eating of an amount of extract or elixir corresponding to about one drachm of the dried leaves.*

Its immediate effect on the bowels is slightly constipating, though this property is not sufficient to make it useful as an astringent, except in the case of infantile diarrhœa, where the leaves are used in hot milk. Another common form of administration is by the mother or nurse transferring from her own mouth to that of the infant the juice from the masticated leaves. Its remote effect, on the other hand, is laxative. This has appeared to me to be especially true when the constipation was due to atony of the lower bowel. In the same way it frequently overcomes flatulence.

In many cases of asthma it has been used successfully in the form of a weak, hot decoction, although it presents the same history of uncertainty as other drugs so used. A cold is often broken up by chewing the leaves in unusual quantity. It seems to act in such cases partly as a general stimulant and partly by stimulating expectoration. As an expectorant its action is ordinarily masked, as the products are swallowed. Its action, however, is continuous from the first. The primary tendency of the cocaine to produce anæmia of the mucous membrane is overcome by the mechanical effect of mastication. Afterwards a reaction takes place, the stimulation extending to the mucous membrane itself.

It has a general repute as an aphrodisiac and emmenagogue. To obtain the former effect it is said to be most successful when taken repeatedly for some hours before the effect is desired, another instance of the cumulative nature of this drug.

* It is customary for the residents of La Paz, after a very hearty meal, to repair to an apothecary's shop, and take upon the spot a "pony" of coca elixir.

In some sections it is reputed as an antiperiodic, but I could not establish the truth of the claim. It is useful in overcoming the "bilious" condition associated with malaria. This effect is almost certainly wholly due to its tonic properties.

There is no doubt that coca-chewing tends to preserve the teeth. No people are so prone to dental caries as these inhabitants of the Bolivian Andes. The trouble is traceable to the lack of nutrition and sudden changes in temperature in passing from one elevation to another. These changes of temperature are made effective upon the teeth, by the necessity for holding the mouth open during respiration, by which alone sufficient air could be brought into the lungs at high altitudes.* It would seem, therefore, that in addition to the mechanical cleansing effect of coca-chewing, a preservative influence is exercised on the teeth by the physiological properties of the drug.

A very common use of coca among the better classes is in overcoming drunkenness or its effects, as in the case of kola-nuts. Strangely enough, this effect is said to be even more pronounced on the day succeeding a debauch, when a strong alcoholic extract is used, than where the leaves themselves are chewed.

Precisely the same effect is to be seen from its use in cases of nervous exhaustion from any other cause, such as excessive overwork or loss of sleep. Its effects in this class of cases are similar to those of no other drug. It does not act as as a narcotic, for the tendency to drowsiness is not especially marked, being, as I believe, wholly dependent upon the conditions which have preceded the use of the drug. The mental confusion and nervous excitement and sensitiveness are removed, and the individual remains bright and tranquil. If it be possible to effect this application of the drug in other countries, it may be considered as its principal function. It has been suggested that the mental effect and the effects upon the respiration, produced by native coca, are the same as those of arsenic, but the phenomena are quite different. It is a noteworthy fact that, while cocaine is said to be synergistic of arsenic and antimony (Bartholow), the chewing of native coca is the chief reliance of miners against poisoning by those two drugs.

* This necessity is exemplified in the fact that donkeys, whose structure prevents breathing through the mouth, are enabled to labor at the highest altitudes only by having their nostrils artificially enlarged.

The highland Indians, to whom the statements made in these papers are applied, are taken, on account of the utterly worthless character of the lowland tribe as laborers, into the lower, fertile regions to perform the heavier of the agricultural tasks. Being mortally afraid of the fevers which there prevail, they rely upon an increased allowance of coca as a preventive.

Its internal and local use for hemorrhoids is said to meet frequently with success.

It is to be noted that the medicinal use of coca-leaves by those who habitually use them means their increased use. The most intelligent reports, however, of its properties come from the higher classes, who resort to it only in emergencies.

Finally, I wish to refer to the properties of native coca as illustrated by some of the peculiar customs and superstitions concerning it. I have already referred to the sensations of nausea, dizziness, and prostration which are induced by exertion at high altitudes. These sensations are especially pronounced upon the occasion of the religious ceremony of reopening a tomb for the purpose of making a fresh interment, or other object, the tombs being placed at the highest altitudes. Upon such occasions individuals are often made to "fall down and swoon." Malignant diseases, it is said, often result from these visits, but it is claimed that if coca-leaves be vigorously chewed before and during the visit these injurious results are averted. Thus they say the gods are appeased by the chewing of the leaves, and it is considered a necessary part of these devotions. The facts probably are that the ordinary symptoms of sorocho are aggravated by the putrid emanations from the tombs, and the virulent diseases result from the latter cause. That coca should do something towards modifying these effects is perfectly reasonable.

All travellers have commented on the occurrence at the summits of all severe mountain climbs of immense mounds of stones (since the advent of Christianity usually surmounted by a cross), which have slowly accumulated during many ages by the continual additions of single stones by the passing *cargadores*. It is said that these mounds have been thus raised in gratitude upon every occasion when the terrible ascent, beneath a heavy burden, has been successfully accomplished. Attributing to their coca the chief credit for this accomplishment, they are accustomed to cast great masses of the chewed and exhausted leaves upon these mounds.

Miners also, observing that they work the more easily, believe that the smearing of these exhausted leaves upon the hard veins of ore tends to soften them. All these facts are only additional evidences of the stimulating effects of the drug.

As to the use of *llipta* with the leaves, the object is precisely the same as in our use of table-salt. It is a pleasant addition to give savor to the article.

The external uses of coca, while very numerous, may be passed over, as they all apply to its properties as a local anæsthetic and to the ordinary effects of a poultice. In the case of painful wounds, it is oftenest applied in the form of a chewed bolus. As a poultice, it is a favorite application for rheumatism and painful swellings.

I have reserved my brief account of the chemical peculiarities of native coca until the last in order that it might be the more readily contrasted with the same subject as applied to the exported leaves, with which I shall begin my second paper.

My methods of examination were necessarily very much restricted, but the work done was performed with great care, and was many times repeated. My method of assay, suggested by Dr. A. B. Lyons, was as follows: Five grammes (75 grains) of finely-powdered leaves were placed in a flask with two ounces of Prollius's fluid, and shaken occasionally for twelve hours. One ounce of the clear fluid was then decanted. Two drachms of acidulated water added, and so mixed as to take up the cocaine. The Prollius's fluid was then evaporated, and the remaining solution filtered. To this solution, after repeated washing with ether, Mayer's reagent was carefully added from the burette, the resulting precipitate filtered, and the process repeated until no more precipitation occurred. The quality of the leaves was estimated by the amount of reagent consumed in the process.

Now, the above process is applied to leaves as they ordinarily reach this country, to indicate the amount of cocaine alone, each cubic centimetre of the reagent consumed corresponding to eight milligrammes of cocaine. On applying the same process to the leaves on the spot, I had no previous information to lead me to doubt the accuracy of the test. That such is not the case, however, will be indicated in what follows.

The test was first applied in the city of Tacna to some leaves which had already crossed the Andes, and had been collected some two or three weeks previously. The result, the exact record of which I have lost, indicated considerably more than one per cent. of cocaine. A portion of the leaves were then made very dry, and enclosed in two wrappers of strong paper and two wrappers of tin foil, and mailed to the United States. Here an application of the same test indicated the ordinary yield of less than one-half per cent. of cocaine, the contents of the package as received being damp and somewhat musty. This experience was many times repeated after I had reached the plantations. An assay by me would indicate the presence of two or three times as much cocaine as the same test, applied to the same sample, upon its arrival in the United States. Without any balances I was unable to verify my results, but it finally occurred to me that my leaves might contain some other body which answered to the same test as the cocaine, and which became lost in transit. I therefore had recourse to the following experiment: The acid aqueous solution, containing the supposed cocaine, was rendered slightly alkaline, and thoroughly washed with ether. This ether was then mixed with two drachms of acidulated water and evaporated. On applying the original test to the remaining acid solution the amount of cocaine was indicated, agreeing very nearly with that found in the same sample of leaves upon its arrival in the United States. The alkaline solution remaining after thus extracting the cocaine still yielded a heavy precipitate upon the addition of Mayer's reagent. These experiments, as stated, were repeated a great number of times with the same result. To me, therefore, there seemed no escape from the conclusion that native coca-leaves contain a body intimately associated with the cocaine and reacting to the same test, which almost wholly disappears from them in transit to the United States or Europe. By the above method this source of error is avoided, the ether extracting only the pure cocaine from the alkaline aqueous solution.

Such are the general peculiarities of native coca-leaves, by which term I mean leaves as they exist immediately after having been collected and properly dried, and before any important changes in their composition have been allowed to take place. From the very extended series of experiments that I instituted some most interesting results were obtained, bearing upon the effects of soil, altitude, sun exposure, age of plant and of leaf, methods of curing, keeping, constituents of other parts of the plant, etc. These observa-

tions are set forth in the tables which follow. It is most unfortunate that the practical value of these tables, as indicating the amounts of cocaine present in the several substances, is almost destroyed, as the most of the experiments were performed before I became aware that I was recording the presence not of the cocaine alone, but of that alkaloid together with two other bodies. From an examination of samples of leaves and preparations that I brought home, very kindly made for me under the supervision of Professor Ira Remsen at the Johns Hopkins University, it is seen that two separate compounds besides the cocaine existed in intimate association therewith, and produced a large part of the precipitation which I had recorded. In a succeeding article Professor Remsen's observations will be fully set forth. While it may be, as he supposes probable, that these bodies occur in all dry coca-leaves, as products of decomposition of the cocaine, yet it is clear that in native coca-leaves they occur in much greater proportion. Hence, while the following tables do not refer to the percentages of cocaine, they do indicate the presence of those compounds to whose occurrence I attribute the marked differences between the properties of native and exported leaves.

Table No. 1 gives the results of assay of a number of lots of leaves, and is introduced to illustrate the relative amounts of precipitation produced on titrating a solution containing all three bodies, and another portion of the same solution from which all but the cocaine had been removed. In the succeeding tables, except the last, only the combined bodies are measured.

TABLE NO. 1.

Assays.	Reagent consumed in titration. Of three bodies.	Of cocaine.	Percentage of cocaine per weight of leaves.
No. 1.....	5 2 c.c.	2.38 c.c.	.75
No. 2.....	5.3 c.c.	1.1 c.c.	.35
No. 3.....	6.2 c.c.	1.6 c.c.	.54
No. 4.....	5.1 c.c.	2.5 c.c.	.80

In the following the discrepancies between the yields, shown in different tables, is due to the employment of different lots of leaves. The intended comparison extends only to the several assays of the same table.

Table No. 2 shows the results of examination of various parts of the plant. It also shows that the amount of precipitable matters in leaves from young plants is less than in those from mature plants. In like manner it was ascertained that those from plants over twenty-five years of age yield less than those taken from plants in their prime.

TABLE NO. 2.

A.—*From Plants under Two Years of Age.*

Part examined.	Reagent consumed.
Mature leaves.....	6.2 c.c.
Mixed bark of stem and root.....	1.1 c.c.
Wood.....	0.0 c.c.
Seed (not obtainable at season).....	.....

B.—*From Plants over Ten Years of Age.*

Mature leaves.....	6.5 c.c.
Bark of stem.....	0.9 c.c.
Bark of root.....	2.0 c.c.
Wood.....	0.0 c.c.
Seed (not obtainable at season).....	.....

Table No. 3 shows the greatest variation between green leaves and the same leaves carefully dried. Ordinarily the yields are almost identical. In drying, the leaves invariably lose sixty per cent. of their weight.

TABLE NO. 3.

Leaves used.	Reagent consumed.
Green leaves.....	7.0 c.c.
Leaves dried to forty per cent. weight.	6.5 c.c.

In all recent properly-dried leaves it will be seen that some have a bright green, or even a yellowish-green, color, while the majority have a somewhat brownish tint. The former are leaves which have been picked before reaching their full maturity. Table No. 4 shows that such leaves yield less precipitable matters than the mature ones.

TABLE NO. 4.

Mature leaves.....	6.8 c.c.
Slightly immature leaves.....	6.0 c.c.

Tables No. 5 and No. 6 explain themselves.

TABLE NO. 5.

Leaves grown in sunshine.....	6.5 c.c.
Leaves grown in shade.....	6.0 c.c.

TABLE NO. 6.

From a light soil, rich in vegetable matter.....	6.5 c.c.
From a decomposed red shale.....	5.5 c.c.
From a heavy clay.....	5.6 c.c.

My last table (No. 7) is the most important, as it indicates the very volatile nature of the compounds associated with the cocaine. It will be seen that certain conditions or modes of treatment, which greatly reduce the total amount of precipitable matters, leave the cocaine almost intact, showing that the loss (by evaporation) falls upon the other compounds.

TABLE NO. 7.

	Total.	Cocaine.
Properly dried leaves (three hours' exposure to hot sun)	6 25 c.c.	2.5 c.c.
Same leaves exposed to hot sun for six hours after being thoroughly dry	4.6 c.c.	2.5 c.c.
Same leaves dried in two hours, on tin, by artificial heat in a dark room	4.3 c.c.	2.1 c.c.

The first two experiments in Table No. 7 leave the subject very incomplete. By subsequent assays it was shown that a continued exposure of the leaves to hot sunshine would still further reduce the total precipitable matters, until very little except the cocaine remained, this persisting in almost the same proportion as at first. Among the casualties of travel a portion of my records was lost, making this table incomplete. Among the lost manuscript also were some tables showing that the amount of precipitable matters increases with the elevation at which the leaves are grown, also one showing that these bodies decrease regularly with the simple lapse of time after the leaves are cured. It has been thoroughly demonstrated that the cocaine itself disappears from the leaves in keeping, but my observations taught me that the associated bodies disappeared first and with much greater rapidity.

It only remains for me to point out that the relative amount of cocaine contained in native coca-leaves exerts no influence in determining the Indian's selection of his supply. As a matter of fact, the ordinary conditions to which the leaves are subject during the first two or three months after they are gathered have but little effect upon their original percentage of cocaine. The Indian, however, makes his selection from among such leaves with the greatest care, eagerly seeking the properly-dried leaves from some favorite cocal, whose produce is always most readily brought out, and absolutely rejecting other leaves, notwithstanding that the percentages of cocaine may be almost identical. I have frequently observed the floor of some little shop thickly set with open sacks of coca-leaves, each of which was marked with a different price, in accordance with its varying quality, affected chiefly by the amount of time which had elapsed since the leaves were gathered. Since, then, the amount of cocaine is practically the same, and the amount of its associated compounds forms an index of the varying estimate which is placed by the Indian upon the relative values of a series of samples, it is fair to infer that it is those associated bodies which give to coca-leaves their value as an article of native consumption.

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(To be continued.)

ON THE TREATMENT OF RHEUMATISM AND NEURALGIA BY THE ELECTRO-VAPOR BATH AND MASSAGE.

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I.—MUSCULAR RHEUMATISM.

THERE are many affections called rheumatism to which the term is applied with doubtful correctness. The affections which have been grouped under the term muscular rheumatism have not yet been classified definitely I believe, but are usually set apart as a kind of a subhead under the chapter on rheumatism in most text-books. It is of very common occurrence, however, both in the acute and chronic form. It is for the purpose of reporting a number of cures of it by the electro-vapor bath and massage treatment that this article is written. However, to show the profession what I mean by muscular rheumatism, I quote the following from Flint's "Practice of Medicine":

"The development is usually gradual. A dull pain is at first felt in certain muscles, which increases, and, at length, becomes more or less severe. The pain is comparatively slight when the affected muscles are at rest. In certain positions the patient may be nearly or quite free from suffering, the constant pain, which may be felt under these circumstances, being of a contusive character, and spasmodic pains occurring from time to time; but in movements which involve contraction of the affected muscle, the pain is severe, cramp-like, and sometimes so excruciating that the patient can hardly repress loud groans or cries. Voluntary movements which occasion the severe pain are avoided as much as possible; but, as it is impossible to maintain rigidly-fixed positions of the body as a whole or of its different parts, the affected muscles are at times thrown into painful contractions, however much the patient may desire to avoid them. Movements occurring during sleep occasion the attacks of pain, and hence the patient is awakened at brief intervals. In some cases the affection changes

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its seat from certain muscles to others, but oftener it remains fixed in the muscles first affected.

"The affected muscles are more or less tender on pressure, the tenderness being diffused over the whole of the space which the muscles occupy, not limited to certain points, as in ordinary neuralgia. The tenderness is usually not great. Aside from the tenderness, there are no local characters, such as swelling, heat, or redness. The local phenomena are not those of inflammation, as in articular rheumatism. If the local symptoms denote inflammation of the muscles, the affection is not muscular rheumatism. Uniform firm pressure over the affected muscles is not only here borne, but affords relief in cases of muscular rheumatism.

"There is little or no constitutional disturbance beyond that occasioned by the suffering and loss of sleep. The appetite and digestion may not be impaired, and there is no febrile movement.

"In the subacute or chronic form of the affection, pain similar to that which belongs to the acute form may be excited only when the affected muscles are contracted with unusual force; the patient experiences suffering when he makes certain violent movements. In other cases, pain is excited by particular movements when they are first made after a period of rest, and the pain shortly disappears if the movements be continued. The chronic, oftener than the acute, affection is apt to shift its situation, affecting now certain muscles, and now those in another part. If the chronic affection remains fixed in particular muscles, they may become somewhat atrophied in consequence of their being kept as much as possible in a state of quietude.

"The duration of acute muscular rheumatism varies from a few hours to a week. Exceptionally the affection continues for several weeks. The duration of the chronic form is indefinite. It is often a very obstinate affection, resisting for many months. The course of the latter is often marked by remissions or intermissions. In certain situations—viz., the loins, the walls of the chest, the muscles of the scapula—the chronic affection is apt to be long-persisting."

In reporting the following cases I have used the classification of Valleix as being the most convenient. (See Flint's "Practice of Medicine," article Rheumatism.)

1. *The Muscles of the Head.*—Situated in the occipito-frontal muscle, the affection is distinguished from neuralgia affecting the trifacial and the occipital nerve by the pain being referred to both sides of the head, by its being excited by the movements of the muscles, and comparatively slight so long as the muscle is at rest, and by the absence of tenderness in disseminated points. The muscles of the eye are sometimes the seat. Movements of the eye, then, occasion more or less severe pain. The temporal and masseter muscles may be affected, causing pain in mastication.

To this class of cases I apply the electro-vapor bath and massage in the following manner: The patient is placed in a steam box, with his feet in a foot-tub of water as hot as can be borne, and the lid closed down, allowing his head to project into the open air through a hole provided for the purpose. The foot-tub is connected with the battery. The operator stands at the side of the apparatus, with the other electrode in his left hand. The right hand he now applies to the patient's head, and the following manipulation is performed: The palmar surfaces of the fingers are used, and the affected muscles are stroked, first gently, and then with increased pressure, as the parts become more tolerant to the current. The force should be exerted gradually from the beginning of the stroke, reaching its climax at the middle of the movement, and lessened gradually to the end. In this way greater pressure and friction is tolerated than could be comfortably borne if the same force were applied suddenly. During this time the heat has been gradually rising in the steam box, until the patient is now in a profuse perspiration. It will probably be found that the rheumatism has yielded to this treatment, and that the muscles now contract without much pain or soreness.

The form of massage used in this manipulation is known technically as *effleurage*, or centripetal stroking, and when employed with electricity may properly be called *electro-effleurage*.

In the treatment of rheumatism of the muscles of the head I find the mixed current valuable. This current is secured by putting in circuit both a galvanic and faradic battery. Great care should be used in employing electricity about the head in conjunction with the electro-vapor bath, for if too strong a current be used faintness is liable to be produced. The milliampère meter should register not more than five milliampères, and it would be better to commence with less, while the induced current should not be used any stronger

than the patient can bear it with comfort. If these points be observed the treatment is exceedingly agreeable.

All good electro-vapor baths are provided with a douche, consisting of a rose-nozzle screwed on the end of a hose. The douche should now be cooled down to a temperature somewhere between 60° and 70° Fahrenheit, and applied for a few seconds over the body of the patient until reaction is thoroughly established. He now should be quickly taken from the bath, rapidly dried with a rough towel, wrapped in a sheet and blanket, and placed upon a couch for a rest of five or ten minutes. The *séance* until this time should occupy from five to fifteen minutes, depending upon the powers of endurance of the patient.

In a certain portion of cases it will be found more or less pain and soreness still remains in the affected muscles after the application of electricity. In such cases *petrissage*, or kneading, should be applied after the patient is taken from the bath. To perform this manipulation, grasp the muscle deeply, and roll it gently between the palmar surface of the thumb and fingers, allowing it to escape from one hand as it is grasped by the other. As the part is being rolled between the fingers it should be squeezed with more or less force, according to the toleration of the tissues. Light *tappotement* with the tips of the fingers should also be employed, striking the muscles quickly and lightly, but not with sufficient force to be disagreeable to the patient.

There are certain cases of chronic rheumatism of long standing, and also others of severe acute nature, that will resist all the means hitherto described for their relief. Such cases should now be submitted to a treatment by the Taylor mechanical manipulator. Placing a large, soft Turkish towel over the rubbing-pads of the manipulator, light rapid friction should be employed for five or ten minutes over the affected parts. I have yet to find a case of simple muscular rheumatism which would resist the combined treatment just described.

Case I.—Female, aged 60. Rheumatism of the occipito-frontalis. Complained of headache, rheumatism in head, back, and shoulders, indigestion, constipation, general feebleness. Yielded to the faradic current readily. It was not until her general system had been built up by a number of electric treatments, in which I employed the mixed current to the spine, and a proper attention to her diet, that she was permanently relieved.

Case II.—Female, aged 50. Acute and very severe attack of muscular rheumatism, affecting head and neck. Case complicated with an old valvular disease of the heart and chronic dyspepsia. It took the combination above described, including the electro-vapor bath and massage, both manual and mechanical, to relieve the attack, which was entirely cured by the second treatment.

Case III.—Female, aged 35. Rheumatism of the occipito-frontalis muscle and of the muscles of the eye. Rheumatism also affecting neck and shoulder. An electro-vapor bath, followed by massage, completely removed the affection in the head, but two or three more treatments were necessary before all the pain and soreness had disappeared from the neck and shoulders.

Case IV.—Female, aged 40. Rheumatism of the scalp, associated with anæmia of long standing. The rheumatism was removed with one treatment, and a course of ten treatments and proper attention to diet greatly improved her general health.

Case V.—Female, aged 30. Has occasional attacks of rheumatism of the scalp, associated with neuralgic headaches of a rheumatic origin. These attacks always disappear under one treatment of the electro-vapor bath, without subsequent massage.

2. *The Muscles of the Neck.*—In this situation the affection, as it commonly occurs, is known by the significant name *rheumatic torticollis*. This name is applied to the affection when situated in the muscles of the antero-lateral aspect of the neck. The muscles on the posterior part of the neck are sometimes the seat of the affection. Valleix applies to the affection in the latter situation the name *cervicodynia*. In this situation it is to be distinguished from ordinary occipital neuralgia.

Case I.—Female, aged 40. Rheumatic torticollis, left side. Cured by two treatments, using the entire treatment of electro-vapor baths and massage, both manual and mechanical.

Case II.—Male, aged 30. Rheumatic torticollis, right side. Two treatments, electro-vapor bath and massage, afforded some relief. Immediately after his second treatment he was seized with a fever of malarial origin, which confined him to his bed for about a week, and he recovered from this attack and his rheumatism simultaneously.

Case III.—Male, aged 50. Rheumatic torticollis, left side.

Case IV.—Male, aged 60. Rheumatic torticollis, left side.

Cases III. and IV. will be reported under heading number 6, "Muscles of the Shoulder."

CASE V.—Female, aged 35. *Cervicodynia.* See Case III. under heading 1.

3. *The Muscles of the Back.*—Valleix calls the affection *dorsodynia.* Seated in these muscles, the pain is caused especially by movements which approximate the scapulæ.

I have had several cases of dorsodynia, associated with rheumatism of the shoulder, under which head I will report them.

4. *Muscles of the Loins.*—In this situation the affection is commonly known as *lumbago.* Valleix designates it *lumbodynia.* This is a frequent seat of the affection in the chronic form. It is to be discriminated from lumbar abscess, lumbar abdominal neuralgia, and the pains incident to aneurism of the descending aorta.

CASE I.—Male, aged 55. Chronic lumbago of ten years' standing, associated with long-continued dyspepsia and constipation. His attacks came on at more or less frequent intervals, and lasted for a few days or a few weeks, depending very much on their severity. For the past five years he has resorted to the electro-vapor bath, which was generally successful in relieving the attack, improving his digestion and regulating his bowels. When he became my patient I added massage to the treatment, and prescribed the following:

℞ Ext. pancreatis,
Quininæ sulph., āā gr. xx;
Ext. nucis vom., gr. vi;
Acidi arseniosi, gr. ⅓.
M. et div. in pulv. xx. In twenty capsules.
Sig.—One before meals.

This prescription improved his digestion permanently, regulated the bowels nicely, and the rheumatic attacks are now few, light, and far between. One treatment at any time is sufficient for their cure.

CASE II.—Male, aged 50. Lumbago, dyspepsia, constipation; narcotism from tobacco, twelve cigars a day; irritable heart. Prescribed a course of fifteen electro-vapor baths, care in regard to diet, temperance as in smoking, fluid extract of cascara sagrada, the above prescription of pancreatine, quinine, etc., which resulted in a cure of his lumbago and a return to his normal condition of health.

CASE III.—Male, aged 60. Has been under treatment for five years for occasional attacks of lumbago. He is also a confirmed dyspeptic. I added to his treatments cascara and the above prescription, and he comes no more, being in excellent health at last account.

CASE IV.—Male, aged 55. Lumbago. Was a repetition of the same history as Case III.

CASE V.—Female, aged 70. Old chronic case of lumbago and dyspepsia. Attacks subacute. An occasional electro-vapor bath keeps her in a very good condition.

CASE VI.—Female, aged 60. Her history is merely a repetition of that of Case V.

CASE VII.—Male, aged 45. Chronic rheumatism and neuralgia for nine years, dyspepsia, constipation. Has suffered much from many physicians, mineral waters, health resorts, and porous plasters, but rather grew worse. Under a long-continued course of electro-vapor baths and massage, manual and mechanical, his condition has been greatly improved, and although his general health is not entirely recovered, the lumbago long ago disappeared.

5. *The Thoracic Muscles.*—Here the affection goes by the name *pleurodynia.* In making the diagnosis, pleuritis and intercostal neuralgia are to be excluded. This may easily be done by ascertaining the absence of the diagnostic characters of the latter two affections. The pain excited by forced breathing, coughing, and sneezing is not unlike that in pleuritis and intercostal neuralgia. In this situation the pectoral and intercostal muscles are affected.

CASE I.—Male, aged 59. Gouty diathesis, anæmia, pleurodynia. The attacks, which happen occasionally, and last for several days, are almost instantly relieved by the electro-vapor bath.

CASE II.—Female, aged 28; daughter of the above. Severe case of acute pleurodynia. Did not yield to electro-vapor bath or massage, nor to the use of salicylate of potassium, but gradually yielded during the use of salicylate of cinchonidine in 2-grain pills three times a day.

6. *Muscles of the Shoulder.*—Valleix entitles the affection here situated *scapulodynia.* It is situated especially in the deltoid muscles, and it is liable to be confounded with arthritis situated in the shoulder-joint.

CASE I.—Male, aged 50. (See heading 2, Case III.) Rheumatism of the left shoulder and neck. This gentleman had been troubled for some months with subacute rheumatism in the deltoid muscle, greatly incommoding him in the use of his arm. Finally, immediately following a severe cold, the rheumatism became worse, and took on such a severe type that he had no rest either day or night. He was not able to raise the arm at all, owing to

the pain and stiffness of the muscles. One treatment of the electro-vapor bath, followed by massage, manual and mechanical, was sufficient to cure the attack. Slight stiffness remained in the shoulder for a few days after the treatment, but gradually disappeared.

CASE II.—(See Case IV., under heading 2.) The history of this case is somewhat similar to the preceding. The attack, however, was entirely an acute one, but the soreness and stiffness of the muscles were exceedingly severe. Previous to visiting my institution, cupping and leeching of the affected part was employed without benefit. One treatment restored the affected parts so far that the patient was able to use the arm freely in dressing himself. Another treatment on the following day was sufficient to effect a cure. In this case the electro-vapor bath, followed by massage, both manual and mechanical, were employed.

CASE III.—Male, aged 45. Rheumatism of the right shoulder. This case was sent by a well-known physician, who had employed ordinary remedies without the least effect. For three months he had been unable to move his arm. One treatment was sufficient to quite restore the affected muscles, although a slight sense of soreness remained. As this gentleman was suffering with chronic dyspepsia, I gave him the prescription of pancreatine and quinine, and a course of electro-vapor baths without massage, also directions about his food. The patient was entirely restored to health after ten treatments, taking two a week.

CASE IV.—Female, aged 40. Had a severe attack of rheumatism of the shoulder, which required two treatments, including massage, both manual and mechanical, under which it was entirely cured.

7. *Muscles of the Extremities.*—Seated in the extremities, the affection is to be distinguished from neuralgia affecting the trunks, and from the affection commonly known as syphilitic rheumatism.

Cases I., II., III., and IV. are the same as Cases I., II., III., and IV. under heading 4, and the patients suffered in addition to their lumbago with rheumatism in the thigh and calf.

CASE V.—Mr. B., aged 70. Rheumatism in muscles of both legs, of a chronic variety. An electro-vapor bath, taken at irregular intervals, keeps him in very good condition.

CASE VI.—Female, aged 45. Rheumatism in both legs and thighs. Dyspepsia, constipation, severe attacks of palpitation of the heart, with more or less dyspnœa. Heart very irritable. This case had been diagnosed as heart-disease by a well-known Philadelphia physician, and her heart was acting so irregularly that I at first questioned the advisability of submitting her to the electro-vapor bath treatment. However, two treatments cured her rheumatic condition, and with it disappeared all of her heart-symptoms, which were evidently of dyspeptic origin. She departed with a prescription of pancreatine and quinine, and reported some weeks after in an excellent condition of health.

CASE VII.—Male, aged 68. Rheumatism in both legs. The affection had become chronic, and was of very severe type. For weeks he had been suffering day and night. During all this time the pain was so great that he preferred sitting in a chair near the fire all night rather than to disrobe and retire to his bed. He was unable to attend to his work, and had become very much reduced in circumstances on that account. Part of the time he had lumbago in addition to the rheumatism in the legs, and was unable to stand upright. During this time he could move about only by crawling about on his hands and knees. Two treatments were sufficient to so far relieve his trouble that he returned to his work, which required him to walk several miles every day; and now, after ten treatments, his health is pretty much restored. As dyspepsia was associated with this case, I prescribed the pancreatine and quinine mixture already referred to before meals, and 20 drops of dilute hydrochloric acid with 3 grains of pepsin after meals.

CASE VIII.—Male, aged 40. Severe attacks of rheumatism in both legs; patient also suffering with indigestion. A treatment is sufficient to relieve his attacks. They are followed, however, in the course of a few weeks, with another one just as bad. I therefore prescribed the pancreatine and quinine mixture and hydrochloric acid as above, since which time the patient's health has been very fair.

CASE IX.—Female, aged 65. Chronic rheumatism in both lower limbs, dyspepsia, and constipation. A course of twenty baths, with massage, pancreatine and quinine mixture, hydrochloric acid, and cascara sagrada effected a cure. This case was of five years' standing, and had been in the hands of able practitioners both in Europe and America, and had received no benefit hitherto from the various forms of treatment adopted.

8. *The Abdominal Muscles.*—The pain and soreness caused by the affection in this situa-

tion may suggest as probable or possible the existence of peritonitis. The disease is to be excluded by the absence of the general symptoms and by firm pressure with the palm of the hand being well borne, as in cases of dermalgia.

9. *The Visceral Muscular Structures.*—The tongue-muscles or those of the pharynx and œsophagus may be the seat of muscular rheumatism, giving rise to pain in speaking and in deglutition. Examples, however, are extremely rare. Seated in the stomach, intestines, and uterus, as it probably may be, to distinguish the affection from visceral neuralgia is impossible, and in fact to consider it as distinct from the latter is to make a distinction without any essential difference. There is reason to believe that the diaphragm may be the seat of muscular rheumatism. It is perhaps more reasonable to consider this as the affection rather than diaphragmatic pleuritis, in certain cases characterized by the arrest of diaphragmatic movements in consequence of pain, and by the intense suffering caused by coughing and sneezing, febrile movement and pleuritic effusion being wanting. It may be doubted if the affection be ever seated in the muscular walls of the heart.

Remarks.—In relation to the forms of current employed in the treatment of muscular rheumatism in the electro-vapor bath, I find, as a rule, that the faradic current is sufficient. In other cases, where faradism is not well borne by the patient, or where it does not produce sufficient effect, the constant current will be found better. In some cases I fancy the mixed current does better work than either galvanism or faradism alone. In the second place, always use the water in the foot-tub as hot as can be borne, and raise the heat in the bath as high as the patient can bear it. If for any reason high temperature cannot be well borne, douche the affected parts well with the hot spray, and use a lower heat in the vapor-bath. The head of the patient should be kept wet with cold water. Use the cooling douche after the bath as cold as the patient can bear it without disagreeable shock, and be sure that a good reaction is secured. In case the reaction is for any reason deficient, the patient should be well rubbed with dry towels and the skin stimulated with alcohol in which oil of sassafras has been dissolved; strength, about half an ounce to the pint. In all cases the patient should rest in a recumbent position for ten or fifteen minutes after the treatment.

Measures to invigorate and promote the general health in addition to the treatment should be employed. Proper attention to diet; exercise in the open air; deep inspirations; and, in cases of anæmia, iron and tonics, are indicated. Persons prone to this affection are apt to have subsequent attacks, so that care should be taken to protect the body from sudden changes in temperature by wearing either woollen or silk clothing in contact with the skin.

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(To be continued.)

CHEMICAL REACTION OF ACETANILIDE.

Dr. M. V. della Cella, in the *Journal de Pharmacie et de Chemie*, 9, 1887, gives the following chemical reactions for acetanilide, by which he claims to be able to discern one milligramme of the drug. He slightly warms a few centigrammes of the drug with a few drops of a solution of deutonitrate of mercury; the addition of two or three drops of concentrated sulphuric acid will immediately color the solution a brilliant blood-red. The following drugs give similar reaction: resorcin, phenol, salicylic acid, gallic acid, and thymol: benzoic acid, however, does not give this reaction. .1 grm. (1½ grs.) of acetanilide was dissolved in one litre of urine, and this solution well shaken with chloroform or ether; the chloroform or ether having evaporated, the presence of acetanilide was easily traced by the above-mentioned reaction. However, Dr. Maragliano frequently tested the urine of patients to whom he had given 0.5 ($7\frac{7}{10}$ gr.) to 1 and 2 grms. ($15\frac{1}{2}$ to $30\frac{8}{10}$ grs.) with the same reaction, but failed to trace the presence of the drug, even when the urine had been allowed to evaporate considerably (by heating) and when baryta-water had been added, or when the urine had been acidulated with sulphuric acid.

The author therefore does not agree with Cahn and Hepp in their statement that acetanilide is found unchanged in the urine. He treated the urine in a precisely similar manner as the above-named investigators (viz., shaking with ether, treatment with soda lye and sulphuric acid, evaporation), and procured likewise the crystals which Cahn and Hepp found. But these crystals did not give the aforementioned reaction, and, according to the author's views, were not acetanilide. Dr. della Cella is, however, unable to state as to the manner in which acetanilide is given off from the body.

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Leading Articles.

DIAGNOSIS AND TREATMENT OF GASTRIC DISORDERS.

PROFESSOR M. GERMAIN SÉE, on the 17th of January, 1888,* read a communication to the French Academy of Medicine, which seems to us to call for an editorial notice in the THERAPEUTIC GAZETTE. It is probably known to all of our readers that for some years physicians all over the world have been studying the relations of hydrochloric acid to gastric disease, and that there is a well-grounded belief in the value of the absence of this acid from the gastric juice as diagnostic of gastric cancer. Pumping out of the stomach is to most patients very disagreeable, and is at first strenuously resisted. Another practical difficulty connected with the hydrochloric acid method of diagnosis has been the difficulty of determining the presence of the acid in the mixed liquids usually withdrawn from the stomach. For this purpose various preparations of aniline have been used, but the reactions of these substances with hydrochloric acid are more or less uncertain; or, at the best, require the presence of a notable percentage of acid and a considerable amount of liquid to be tested. In the latter part of 1887, Dr. Gürnzbourg proposed the employment of a new reagent, whose relations with hydrochloric acid are so fixed and delicate as to much facilitate the work of the clinician. This substance is phloroglucin-vanillin.

Phloroglucin and vanillin both now occur in commerce, and can be readily purchased. In making the solution for practical use thirty grains of the phloroglucin and fifteen of the pure vanillin are to be dissolved in one ounce of absolute alcohol. In order to recognize the presence of hydrochloric acid in the gastric juice, it is only necessary to filter a few drops of the gastric liquid, and add them to a like quantity of the solution just described, the whole being afterwards slowly evaporated at a low temperature, with great care to prevent boiling, in a porcelain capsule, when a mass of red isolated crystals will be left behind. If there be much albuminate or peptone in the gastric juice, the crystals will not be isolated, but there will be left a reddish residue, which is composed of a mixture of albuminates and of fragments of crystals. The test is so delicate that one-tenth part per thousand of the hydrochloric acid can be readily recognized, and the changed color is said even to occur with the one-twentieth part per thousand, although below this strength the reaction does not ensue.

Various methods have been employed for the purpose of obtaining the gastric juice from the stomach. The phloroglucin-vanillin has the great advantage that it is so sensitive that only a very little liquid is necessary for a successful performance. In the method of Ewald and Boas, a meal is taken early in the morning of a little white bread and some water, and an hour after this the stomachic liquid is withdrawn. Jaworski and Gluzinski have found that when an egg is given, about an hour and a quarter is necessary for its complete disappearance from the stomach. They therefore aspirate the gastric juice at intervals of about a quarter of an hour, and

* It is a curious instance of the development of the Asiatic world that the same mail which brought to us the statements made in January before the French Academy of Science by Professor Sée brought also the declarations of Professor E. Baulz made at the November meeting of the Sei I Kwai, and referring the readers to the *Chugan Jiji Shimpo* for absolute details of the new method. Although Tokio may tread close upon the heels of Paris, it must be still acknowledged that Europe is a little ahead, for we find nothing in the statements of Professor Baulz which are new to us.

obtain it in different degrees of acidity and peptonization. The most convenient way, according to Sée, is simply to withdraw the fluid from the stomach in fifty to sixty minutes after the ingestion of an egg with a small quantity of water.

The studies of M. Sée have resulted in his dividing all forms of indigestion, with alteration of hydrochloric acid solution, into three groups,—namely, those in which there is little or no hydrochloric acid, those in which the hydrochloric acid is in excess, and those in which it varies greatly from day to day. Absence of hydrochloric acid was at one time supposed to be diagnostic of cancer, but the researches of Cahn and Mering have shown that the acid may be entirely wanting in acute fevers, and those of Van der Velden, Riegel, Ewald, Sée and others, seem to prove that there are several chronic stomachic affections in which the secretion is abolished. These are, first, cancer, either with or without dilatation of the stomach; second, certain so called catarrhal dyspepsias, in which there is an atrophy of the stomachic glands, as, we believe, was first demonstrated by Boas; third, dyspepsias which are dependent upon or connected with a general marasmus or inanition, such as is seen in advanced conditions of Bright's disease, diabetes, cardiac affections, etc. It is probable that in many, if not all, of the latter class of cases there is a secondary atrophy of the stomachic glands.

In indigestions with excessive gastric acidity, the sufferer usually complains very much of strongly acid regurgitations, heartburn, and gastric pains, often associated with vomiting, which, when it occurs, relieves the distress. The appetite is wanting or slight, tongue heavily coated, bowels usually constipated, and not rarely there is a tendency to emaciation. Commonly in these cases there is special lack of power of the digestion of starchy or saccharine foods. This form of dyspepsia often occurs in ulcer of the stomach, and, according to the experience of the writer of this leading article, is usually either connected with this condition or with a chronic inflammation of the gastric mucous membrane. It is especially this form of dyspepsia in which nitrate of silver, given in doses of ¼ grain half an hour before meals, is often of great service. The silver must always be administered in a coated pill, the object being to bring it directly in contact with the mucous membrane of the stomach. If, in addition to the hyperacidity, there be slight epigastric tenderness, the therapeutic indication for the nitrate is to be considered absolute.

In Professor Sée's third group of cases, in which there are great oscillations in the secretion of hydrochloric acid, are included certain forms of dyspepsia with much flatulence.

The question as to the presence of pepsin in the gastric juice of dyspepsia is one of much interest. It has been shown by Boas that it may exist in a stomachic fluid which contains no hydrochloric acid and has a neutral reaction. If both hydrochloric acid and pepsin be absent in any case persistently, the condition of grave atrophy of the gastric tubules, or of total destruction of the function of the stomach by cancer, would seem to be made out.

The various researches into the conditions of the gastric juice in dyspepsia at first sight suggest as a hopeful method of therapeutics the artificial alteration of the gastric juice, so as to atone for the lack of natural secretion. Thus hydrochloric acid would appear to be indicated when it is not formed; alkalies, when there is an excess of acid. Such medication does offer some hope of good, but the scope of its usefulness is very limited. Thus, in a case of grave organic lesion of the stomach it is not the absence of hydrochloric acid from the gastric juice and the consequent failure of digestion which destroys the life of the patient so much as the progressive gastric changes, and the employment of hydrochloric acid cannot reach the disease itself, but only by aiding digestion prolong for a little the conflict. Then, again, in the hyperacidity of the stomach, alkalies are indicated, but can only act as palliatives, giving momentary relief.

When hydrochloric acid is employed to aid in digestion, it must be remembered that the process of digestion is a continuous one, and that, therefore, it is necessary to repeat the administration of the acid several times during the two hours which follow the ingestion of food. Five drops, well diluted, may be given every half-hour until four doses are taken. In hyperacidity it is equally necessary to repeat the alkali. In most cases we think much larger doses should be employed than are habitually given. The ordinary after-dinner dose of bicarbonate of sodium is 5 to 10 grains. Professor Sée affirms that at least 75 to 125 grains are necessary, and that this amount ought to be given in two or three doses in the two or three hours during which digestion continues.

HYDROBROMATE OF HYOSCINE IN RECURRENT AND ACUTE MANIA, AND AS AN HYPNOTIC.

THE views which were first expressed in the THERAPEUTIC GAZETTE as to the hypnotic value of hyoscine are daily receiving more and more extended confirmation. The most recent communication on this subject which we have met is that published by Dr. George Thompson, superintendent of the Bristol Insane Asylum, in the *Lancet*, February 4, 1888. Dr. Thompson states that he and his colleagues have used this drug in a number of cases in doses of from $\frac{1}{100}$ to $\frac{1}{200}$ of a grain, and have found that while on all occasions it acts as a certain hypnotic, it is of most use in cases of chronic and recurrently chronic mania. He finds, in common with others, that an overdose produces marked sluggishness of all the motor functions, with depression of reflex activity and dizziness, dimness of vision, ataxic gait, and dryness of the mouth and fauces. In no case, he claims, given in proper dose, has it failed to produce the desired effect. The patient is quiet, and falls asleep, but the sleep is not very deep, and at no stage is there any difficulty in arousing the patient to the fullest extent of wakefulness, though he soon falls asleep again. In acute mania, especially where there is much restlessness, with dry skin and some suppression of urine, a small dose produced a much more comfortable condition.

For some time Dr. Erb, of Heidelberg, has been actively engaged in experimenting with hyoscine, especially with reference to its therapeutical action in paralysis agitans.

Kobert, in his extensive work on the subject, found that hyoscine, although isomeric with atropine and hyoscyamine, is totally different from either, both in its chemical and pharmacological properties. So far only three salts of hyoscine have been made,—the hydroiodate, hydrobromate, and hydrochlorate (muriate). According to Kobert the last named is the most practicable, as its actions are milder.

Dr. Erb's experiments, which are spoken of in the *Zeitschrift für Therapie*, August, 1887, do not confirm Kobert's statements, as his (Erb's) experiments show no difference whatever in the three salts as far as strength is concerned; if anything, the muriate of hyoscine is the most active of the three, as it contains more pure hyoscine than the others.

The doses used were very small, ranging from .0002 gramme ($\frac{1}{320}$ grain) to .0004 gramme ($\frac{1}{160}$ grain), or, at the highest, .0008 gramme ($\frac{1}{80}$ grain), and were given subcutaneously. When given in this way the actions were always much prompter than when given in pills of similar doses (.2 to .3 milligramme,—$\frac{1}{320}$ to $\frac{1}{200}$ grain).

Some patients seem to tolerate the drug better than others. In some cases of phthisis in women, and also in some cases of paralysis agitans, doses of .3 to .5 milligramme ($\frac{1}{200}$ to $\frac{1}{120}$ grain) produced unmistakable therapeutical and toxic effects, while in other cases .7 or .8 milligramme ($\frac{1}{90}$ to $\frac{1}{80}$ grain) were given without any very great effect.

In most cases the drug caused enlargement of the pupils, lessened their reaction to light and hindered accommodation, but in some cases these symptoms were absent, or only slightly indicated, even when relatively large doses had been given. In some patients the vaso-motor nerves were visibly affected, the face burning and highly colored. Usually, however, this was not the case.

Its action upon the salivary glands was the same in nearly all the cases, the patients complaining of a dryness of the throat and neck. In patients who were suffering from salivation every injection of the drug would temporarily check the symptoms. Upon perspiration hyoscine acts similarly to atropine. In a few cases of phthisis Dr. Erb prescribed hyoscine for the night-sweats, but the drug caused such serious accompanying symptoms that its use had to be abandoned, and in small doses its action was uncertain.

A narcotic action was frequently observed. After injections of the drug many patients complained of great weariness and sleepiness, and often sleep would follow its use. But only in one case did the author observe it to act as a true "sleeping potion;" this was in a man who was suffering from hypochondriacal neurasthenia. All the usual remedies, such as morphine, bromide, urethan, chloral, paraldehyde, etc., had been tried without avail, and nothing seemed to affect the stubborn insomnia. At last injections of .5 to .7 milligramme (1 milligramme equals $\frac{1}{64}$ grain) of muriate of hyoscine were given, and the patient at once fell into a tranquil sleep, which lasted nearly eight hours. The drug was frequently used upon the patient, always with the same result, and never causing any unpleasant accompanying symptoms.

Serious toxic actions, similar to those described by Sohrt and Wood, were also observed by Dr. Erb in a nervous patient, who was suffering with double floating kidneys and

peristaltic restlessness of the bowels. After an injection of .6 milligramme ($\frac{1}{100}$ grain) of hyoscine, the patient in a few hours began to reel about as if drunk, talked flightily and indistinctly, and acted in a most wild manner. Her face was red and hands cold; she became very weak and sleepy; pupils were moderately dilated, and reacted badly to the light. These symptoms gradually disappeared without leaving any distinct remembrance of them.

The feelings experienced by most patients after injections of hyoscine were: a feeling of general weakness, sleepiness, hot face, dryness of the throat, slight dizziness, confusion, indistinct sight, and difficult speech.

Dr. Erb paid particular attention to the action of hyoscine in certain motor irritations, and especially in the trembling which accompanies paralysis agitans. Usually the practitioner is utterly unable to relieve this trembling. Hyoscine, however, seemed to have a magic effect upon these symptoms, so speedily did it relieve them, even in most severe cases. Ten or twelve cases of this kind were treated by Dr. Erb, six of which were in his clinic, and thus he had the opportunity of carefully observing their symptoms. The author states that he never observed any permanent cure to result from the use of hyoscine, but as long as the treatment was continued the symptoms did not return. In one case only was there a slight relapse during treatment. Every injection of the drug was immediately followed by a feeling of great relief; moving and walking were accomplished with far greater ease than before, and the trembling ceased. In some cases the trembling ceased entirely, but again in others the relief would only last for several hours or half a day. The muscular contraction was relieved, and the patients were again able to feed and dress themselves without assistance. Other accompanying symptoms, such as salivation and profuse perspiration, were observed in a few cases, but disappeared in the course of an hour or so.

It seemed that in cases of the above kind extremely small doses were sufficient to produce the desired effect, usually only .2 to .3 milligramme (about $\frac{1}{250}$ grain) being given, and even this dose frequently caused marked accompanying symptoms, which prohibited the thought of increasing the dose, but they always were active in relieving the symptoms of trembling, etc., and were gratefully taken by the patient. We are informed that Dr. H. C. Wood as long as a year ago used hyoscine in paralysis agitans. According to his opinion it is a very valuable drug, quieting tremors, and especially useful in advanced cases where there is much pain. When the pain is so severe at night as to produce weakness, hyoscine is especially indicated. Under these circumstances its administration should be restricted to the evening, because sooner or later it loses its power over the disease, or else must be given in continually increasing doses.

Dr. Erb experimented with hyoscine in other forms of spasm, such as spasm of the facial and accessory nerves, also in spasm of the muscles of the back, shoulder, abdomen, etc., and in most cases the results were very satisfactory. In one case of tetanus one injection caused an immediate change for the better, but later, when the symptoms reappeared, its use was without avail. In two severe cases of spinal accessory spasm, however, in the practice of Dr. H. C. Wood, hyoscine was thoroughly tried, and although for a time it did seem to exert some controlling influence, the result was on the whole not satisfactory.

Hyoscine has an undeniable effect upon certain motor irritations, and might also be used in cases of salivation and perspiration, and therefore further researches upon the subject would doubtlessly yield information which would be of great value to therapeutics. Great caution is necessary in its use, and we would especially warn against overdoses, as in several cases toxic effects have been noted as resulting from doses of a fraction of a milligramme.

ANTIPYRIN DURING LABOR.

WE would like to call the attention of our readers to the statements made some little time since by Professor Chouppe, that antipyrin is capable of relieving uterine pains after parturition or dysmenorrhœa. In a case of violent hemorrhage from uterine tumor Chouppe found that ergot was capable of controlling the hemorrhages, but that the uterine contractions produced by it were horribly painful, even morphine being unable to subdue them. Subsequently he gave antipyrin with the ergot, and had the pleasure of seeing the hemorrhages completely controlled without suffering. He believes that the ergot produced uterine contractions, which were rendered painless by the antipyrin.

So, also, in the *Comptes Rendus* of the Société de Biologie of December 30, 1887, there is an account of the successful use of anti-

pyrin to ease the pains of labor, by Dr. E. Laget, of the School of Medicine of Marseilles. Dr. Laget was called to a young lady, who had already several times miscarried, and who was taken with the pains of labor after about five months' pregnancy. The pains, which were very severe, resisted laudanized enemata, administered at intervals during forty-eight hours. On the third day, the pains continuing almost without intermission, and becoming sometimes insupportable, Dr. Laget remembering the recent communications of Dr. Chouppe to the Société de Biologie (July 16 and November 19, 1887), prescribed an enema containing antipyrin (2 grammes in 100 grammes of water; 16 grains in about 3½ fluidounces). The pains diminished a little, but still persisted with some violence. One hour later another similar enema was given, and a quarter of an hour later the pains diminished most remarkably. The uterine contractions occurred every eight or ten minutes, with slight but supportable pain; the labor continued regularly in this manner for three hours, when the fœtus was expelled; the placenta followed shortly afterwards. The patient had no after-pains, and her convalescence proceeded normally. Dr. Netter calls attention to the fact that, although the use of antipyrin diminished the pains, not only did the uterine contractions retain all their force, but that, the exhaustion caused by excessive pain having ceased, each contraction was more effective. The quantity of antipyrin employed was moderate, and it is possible that it might be administered in larger doses without inconvenience, and with more decided effect.

A substance which would not interfere with uterine contractions during labor, but would overcome the pain element, would be a boon to suffering womanhood, that would cause the whole female race, or at least the married part of it under fifty years of age, to rise up and call blessed the discoverer. The matter is so easily tested that we trust some of our readers who are unfortunate enough to be obstetricians will make the trial without delay and inform us of the result.

JAMBUL, ORTOSYPHON, AND EUPHORBIA DRUMONDII.

WE are authorized by Mr. George S. Davis to state that there are certain new drugs of which Parke, Davis & Co. are at present prepared to place reasonable amounts, without charge, in the hands of any physician who may desire to investigate their properties. As the supplies of these drugs are of course limited, they can only be furnished so long as the present supplies last. It has seemed to us proper in the editorial columns of the GAZETTE to call attention to these drugs and the knowledge we have as to their application to the treatment of disease. First among them is jambul, the product of the *Eugenia jambolana*, a myrtaceous plant, which grows in the East Indies to a considerable size, with a thick and rather crooked trunk, and yields during the months of July and August an abundant crop of subacid edible fruit. It is cultivated on account of its hard, close-grained, durable timber, and the value of its bark, as a brown dye-stuff. The berry itself is olive shaped, varying in size from a pea to a pigeon's egg, blackish-purple, and succulent. The whole tree has stringent properties, and the leaves, bark, and seed are employed medicinally by the natives of India for the relief of diarrhœa and dysentery. Dr. Bamatvala was the first to allege that the seeds of jambul are a valuable remedy in the treatment of *diabetes*, the dose being 5 grains of the powder every four hours. In the London *Lancet* for October, 1887, Mr. Robert Saundby states that he has employed the drug in doses of 5 grains three or four times a day in diabetes. Eight distinct trials were made. In five there was an increase of the sugar and in three a decrease. In the *Lancet* of October 8, 1887, Dr. E. H. Fenwick states that he has found the drug of no value in diabetes insipidus, but when given to cases of diabetes mellitus it had seemed to be of great service, especially in cases in which there were sloughing wounds. Its employment was followed in such patients by a great decrease in the amount of urine eliminated, and especially by a rapid healing of the sloughing ulcers. Dr. Caldwell (*Med. Age*, May 25, 1886) has used the drug in four well-marked cases, in three of which it seemed to do good. It will be seen that our knowledge of the action of jambul is purely clinical, that the drug has not been tested enough in diabetes to allow us to come to any positive conclusion, and that while in some cases it has apparently done good, in others it has failed to achieve anything.

Ortosyphon stamineus is a plant which grows in Java and in India, to which attention was called in April, 1887 (*Repertoire de Pharmacie*), by Mr. Perinelle, who states that for a long time it has been used in Java on account of

its action upon the kidneys and bladder, and that recently in that island it has attracted much attention from having cured the Governor-general of gravel after previous long and useless treatment. Its leaves are prepared for commerce by drying and rolling up somewhat in the manner of Chinese tea, and afford an infusion of a very agreeable odor and orange-brown color. Perinelle failed to find in it an alkaloid, and believes that its active principle is a glucoside. It seems also to contain a volatile oil, as it yields a very aromatic distillate. There has also been prepared from it a bitter, brown, watery extract. A Hollandish chemist, Van Itallie, has examined the leaves, and found them to contain a resinous acid, volatile oil, tannic, citric, and tartaric acids, besides a glucoside, for which he suggests the name of *orthosiphonin*. This he obtained in acicular crystals, of a taste at first bitter, and afterwards sweet, soluble in cold water, slightly so in absolute alcohol, chloroform, and ether (*Repertoire de Pharm.*, June, 1887, No. 6).

Messrs. Parke, Davis & Co. have also on hand a small supply of *Euphorbia Drumondii*, which our readers will remember is claimed by Dr. John Reid to contain an anæsthetic alkaloid,—the so-called *drumine*. We have already on several occasions questioned the existence of such an alkaloid, or, at least, have claimed that no *proof* has been advanced as to its existence. Any one, however, who wishes to investigate the matter for himself may obtain a supply, collected by their own agent, from the above firm, or may obtain a fluid extract for experimental purposes.

Reports on Therapeutic Progress.

ANTISEPTIC PROPERTIES OF LANOLIN AS AN OINTMENT BASIS.

Dr. Gottstein, in an article to be found in the *Berliner Klinische Wochenschrift*, of November 28, 1887 (*British Medical Journal*, No. 1406, December 10, 1887), sums up the above subject by the statement that lanolin is absolutely inimical to the growth of microorganisms of whatever kind they may be. C. Fränkel had already stated that lanolin is free from germs not only when prepared but also in the raw condition of wool fat. It is well known that this substance does not undergo decomposition under the influence of the air, even when water or an alkaline solution is present, whereas all ordinary fats (glycerin fats) spontaneously decompose and become rancid from the separation of their appropriate fatty acids. Now, such decomposition of a body depends upon whether it is a fit material for the growth of bacteria or not, and it might therefore be asserted beforehand that lanolin is inimical to bacterial life. But Dr. Gottstein has submitted the question to direct experiment, and has found that no bacteria of any kind can be grown upon or in lanolin. Certain kinds of bacteria connected with putrefaction perish also in glycerin fats, and this is owing to two causes: first, because the fatty acids set free are hostile to bacteria; and, secondly, because most germs found in the air are aërobiotic,—that is, they require a fitting nutritive basis, the oxygen of the air, for their development. The air, however, contains also anaërobiotic germs, and it can be shown by experiment that sterilized (ordinary) fat, after it has been exposed for a few days, and has undergone the usual changes (a yellowish appearance and rancid odor), contains anaërobiotic germs in its interior. This is one of the chief distinctions between lanolin and ordinary fats, for such germs are not found and cannot develop in lanolin. But a second series of experiments showed in a still more striking manner the difference in this respect between lanolin and ordinary fats. When bacteria develop in a certain nutriment, even though the latter undergo no visible alteration, they will penetrate into any underlying nutriment of fit character, and develop in it also. But if the layer into which they are first introduced be adverse to their growth, it will prevent their penetration into the adjacent layer of nutriment. Thin layers of different kinds of fats, including lanolin, were poured over the gelatin surface in various test tubes respectively, and each tube with its gelatin-covered fat was thoroughly sterilized. After a few days anaërobiotic bacteria, or, rather, solid substances known to contain such bacteria,—for example, garden mould and old cheese,—were dropped upon the fat. The constant result was that bacteria rapidly developed in fat pork, and extended to the gelatin, while in the lanolin glasses the gelatin remained perfectly clear. The contrast was very striking. The results of the experiments taken together are as follows: 1. The bacteria which take part in the spontaneous decomposition of glycerin fats are presumably anaërobiotic. Of aërobiotic germs, several kinds (some of which are connected with ordinary putrefaction) perish upon a fatty nutrient basis, the rapidity with

which they die being in direct proportion to the amount of fat present. 2. Exposed ordinary fat is found to contain anaërobiotic germs after a few days; lanolin similarly exposed contains no germs of any kinds. 3. Glycerin fats can be penetrated by bacteria; lanolin, on the contrary, forms an impermeable layer. The above facts are of interest therapeutically and biologically. As regards biology, Liebreich has shown that cholesterine fats, which are chemically the same as lanolin, are a normal constituent of the epidermis in man and the lower animals, thus constituting the most powerful protection against infection from without. Furuncles may appear, it is true, and may be shown to contain pus-cocci, but no connection in point of time exists between this development in superficial or deeper layers of the skin. And furuncles are always a sign of deficient vitality of the skin; for example, in the stage of convalescence after typhoid, and in marasmic children. There must be a causal connection between these fats. Therapeutically speaking, lanolin has a great future before it. Its miscibility with water in any proportion, its ready absorbability by the skin, its freedom from any tendency to rancidity, as confirmed and explained by the above experiments, constitute it the vehicle *par excellence* for cutaneous medicaments. Its preservative properties ought also to find practical application in other ways.

THE REFLEX INHIBITORY ACTION OF COCAINE AS A DIAGNOSTIC FACTOR.

At a meeting of the Medical Society of London, held January 9, 1888, Mr. Hurry Fenwick read a paper (*Brit. Med. Journ.*, January 14, 1888) upon a long series of cases in which pain in various parts of the body had been temporarily relieved in thirty to one hundred and eighty seconds by urethral injection of twenty per cent. solution of cocaine. Cases of its action in neuralgic pain of the cranial, cervical, intercostal, renal, and lumbo-sacral nerves were mentioned, and the reasons for this power were roughly demonstrated to the society by means of decapitated frogs. Thus, without a vesico-rectal injection of cocaine, the leg of the decapitated frog was rapidly jerked out of a weak acid solution in some fraction of a second; but after cocaine had been injected into the bladder or rectum, the leg was not withdrawn until after twenty to thirty or more seconds. This remarkable inhibitory power was only observed when weak acid solutions (that is, weak irritations) were used. Cocaine possessed no power of delaying the reflex excitability consequent upon stronger acid solutions. The following propositions were formulated: 1. Slight nerve irritations (as neuralgias) of any part can be relieved by injection into the urethra of a few drops of a ten or twenty per cent. solution of cocaine. 2. Severe nerve irritation, as in the pain of carcinoma, inflammation, etc., cannot be thus relieved. Mr. Fenwick has used this knowledge largely in the differential diagnosis of urinary disease. Thus, if a renal pain was immediately relieved by cocaine, he judged the neuralgia to be due to a slight irritation, such as that experienced in lithiasis, congestion, or grit. If unrelieved (and cases were given) he diagnosed more serious cases (for example, stone, dilated pelvis, etc.). He then drew attention to the value of cocaine in operations upon the bladder and urethra in preventing damage to an unhealthy kidney. M. Tuffier's experiments upon renal congestion, produced by distending the bladder or injuring the walls, were mentioned, and it was submitted that this flooding of the kidney—which, if the organ was damaged, led to rigors, suppressions, and suppurations—might be partially or wholly prevented by the inhibitory action of cocaine upon the renal circulation.

TREATMENT OF CHRONIC ARTICULAR RHEUMATISM.

This formed the subject of an address delivered before the Sixtieth Versammlung Deutscher Naturforscher und Ærzte, by Herr von Ziemssen, of Wiesbaden. The conclusions were that: 1. Chronic articular rheumatism was a general disease, and that when localized there was no guarantee that it would not again become general. 2. The treatment must, therefore, be general. 3. The disease was frequently so inveterately associated with one spot that local treatment was also called for. 4. On the affected joints there were almost always some accurately-defined spots, which could be identified by palpation and by the feelings of the patient. 5. The disease was often complicated either in such a way as to render diagnosis doubtful, as in the case of arthritis, lues, gonorrhœa, and after-traumatism, or as in the case of rheumatic affections of another kind, such

as muscular rheumatism, rheumatic neuralgia, sciatica, and heart-affections. The complications need to be simultaneously treated, and treated until complete recovery, but a relapse was not remarkable. The rheumatic diathesis was the uncured disease itself. Treatment must, therefore, be both general and local. The *general* consisted in regulation of the diet, remaining in the open air, increased activity of the cutaneous function, warm and hot baths, woollen clothing, and regulation of the whole manner of life, and further large doses of salicylate of sodium. This remedy properly given was well borne, in the absence of contraindications, and acted so specifically that when it failed one could conclude that an error in diagnosis had been made. The *local* treatment put in force at the same time was massage with the warm douche in the warm bath as carried out at Wiesbaden. By means of gas motors and interplaced bellows a perfectly equable stream of 1 to 7 atmosphere strength could be played upon the part, while the masseur was at the same time performing massage. He recommended this force of spray also for other forms of rheumatism.—*Med. Press*, December 28, 1887.

THE LIVER THE EXCRETORY ORGAN FOR IRON.

The way in which iron introduced into the body is excreted being somewhat obscure, Dr. Zalêski, of Dorpat, has endeavored to clear up our knowledge of the subject by some very carefully planned experiments. He first took two rabbits of the same litter, as nearly as possible of the same color and weight, and reared them under similar conditions, taking care that they had access to no food or drink containing any iron. When they were ten weeks old they were kept without food for four days, being allowed water only. Into the jugular vein of one of them was then introduced 3 cubic centimetres (50 gtt.) of a solution of sodio-tartrate of iron, containing .0096 gramme (about $\frac{1}{10}$ grain) of metallic iron. No symptoms of acute poisoning occurred during three hours. At the end of that time the carotid artery was opened, and as much blood as possible removed. The whole vascular system was then thoroughly washed out by means of a special apparatus which is used for this purpose in the Strassburg Pharmacological Institute. The liquid employed was a warm weak solution of sugar, which was introduced into the aorta and allowed to run out from the portal end. This washing out was continued till the red tint of the muscles and other organs had disappeared so completely that the spectroscope detected no hæmoglobin lines. The other rabbit was also deprived of blood in precisely the same way. The organs of the two animals were then examined chemically, and the iron contained in them accurately estimated by the volumetric method. The result showed that the only organ in which the percentage of iron was markedly increased in the animal into whose system the sodio-tartrate had been introduced was the liver, the dry substance of the organ containing .0998 and .1723 per cent. of iron in the two animals respectively. A similar research was subsequently carried out in the case of two kittens. Here the livers contained respectively .0431 and .0895 per cent. of iron, most of the other organs showing more iron in the animal into which none had been introduced than in the one in which the sodio-tartrate had been injected. The most remarkable instance of this was the muscular tissue, which, in the kitten that had had no iron, showed a percentage of .0206, and in the one which had had iron only .0073. Of this curious fact Dr. Zalêski does not see his way to offer any explanation, and it certainly appears somewhat paradoxical. In both the rabbits and kittens it was plainly demonstrated that the walls of the stomach and intestines contained no more iron in the animals which had been subjected to the intravenous injection than in the others. The result of the research would appear to suggest that the liver has some claims to be considered the excreting organ for iron.—*Lancet*, January 21, 1888.

THE USE OF STRYCHNINE AS AN HYPNOTIC.

Quiet sleep usually comes readily and quickly to any healthy person who is tired, but not overtired, with bodily or mental work. But, as too many know, there is a condition of excessive fatigue, either bodily or mental, and more especially of that fatigue which follows intense mental strain or worry, which prevents the unhappy sufferer from obtaining the rest and refreshment by sleep of which he stands so greatly in need. The treatment of such cases is very difficult. The use of opium or other narcotics is objectionable, not only because it may tend to induce that dreadful condition, the opium-habit, but because it frequently happens that the sufferer

from sleeplessness is obliged to have all his faculties clear and all his wits about him in order to get through his daily work. The administration of opiates at night tends in many people to produce a certain amount of dulness through the day, which would render the use of these drugs inadmissible, even if there were no other objection to their use.

Chloral is not so objectionable on this account, as it may induce sleep without in the least obscuring the mental faculties next day, but the use of chloral also is objectionable, both because of the tendency to the formation of a chloral-habit, and because its long-continued use may have a weakening action on the heart and also a deleterious action on the brain.

Bromide of potassium is probably the least objectionable of all, but in many cases of overwork it seems to lose entirely or almost entirely its hypnotic action. In a paper published by DR. T. LAUDER BRUNTON in the *Practitioner* for January, 1888, the idea is advanced that in persons engaged in literary work, who suffer from insomnia and yet are prevented from the use of the ordinary hypnotics from the necessity for keeping their brains perfectly clear during the day, if the condition of over-exhaustion could be removed the patient would naturally fall asleep without the use of any hypnotic. In certain cases it appears possible to accomplish this to some extent by giving some warm beef-tea or a teaspoonful of Valentine's meat-juice in water, either hot or cold, or by giving a little alcoholic stimulant, such as whiskey and water or brandy and water. From the fact that strychnine is one of the most powerful stimulants, it occurred to Dr. Brunton that a small dose of it might have the effect of bringing the depressed nervous system up from the condition of over-fatigue to that of simple fatigue, and thus inducing sleep. He accordingly tried it, and found that it acted exactly in the expected manner, and induced comfortable, healthy sleep without any disagreeable effects next day. The way in which he has administered it has been either in the form of the tincture of nux vomica in doses of 5 to 10 minims, or one, two, or four granules of strychnine sulphate, each containing $\frac{1}{200}$ of a grain, given at bedtime, and the dose repeated if the patient happened to awake within one or two hours afterwards. It seems doubtful whether strychnine would answer in other cases of sleeplessness than in those arising from overwork or worry, and more especially from overwork. Dr. Brunton claims that the results which strychnine has yielded in his hands have been so good, and the condition for which he has used it is so distressing, that he feels confident that others will be as satisfied with its action as he is himself.

HALF-DRACHM GLYCERIN ENEMATA.

DR. ST. V. VÁMOSSY has found that an enema of half a fluidrachm of glycerin will, as a rule, produce a tolerably copious evacuation within two minutes. The stool is not loose like those produced by purgatives, but well formed; the more fæcal accumulation there is in the bowel, the more energetically the glycerin acts. Generally more than one evacuation is produced, but for two or three days afterwards there is constipation. The mode of action probably depends on the setting up of a hyperæmic condition of the mucous membrane of the lower extremity of the rectum which stimulates the nerves supplying it, and thus by reflex action causes an increase in the peristaltic action of the muscular coat of the bowel. Some sensitive patients complain of a burning sensation at the anus when pure glycerin is used, so Dr. Vámossy suggests that it may in these cases be diluted with a third part of water. It is important to use only chemically pure glycerin, as this substance is liable to contain chlorine, which, of course, would tend to irritate the mucous membrane. He employed glycerin enemata in one hundred and fifty cases of various kinds, including simple constipation, intestinal affections, acute febrile diseases, surgical operation cases, and apoplexy, and from this considerable experience he is able to recommend it to other practitioners, both for hospital and private patients of all ages and both sexes.—*Lancet*, January 7, 1888.

OVARIOTOMY IN A CHILD.

Ovarian tumors and cysts have been very rarely observed in children. Doran and Winckel write of an ovarian cyst where the ovary was not yet developed. Among the other authorities who have observed single cases of ovarian cyst in children are Carr, Thomas, Courtz, Marjolain, Wegscheider, Kiwisch, and others.

If ovarian cysts are rare in children the operation of ovariotomy is still rarer; in fact, only eight cases have ever been reported. The operators were Bekker, Spencer Wells, Schwartz, Thomson, Küster, Alrott, and Kid.

DR. POLOTEBWON has only recently per-

formed this operation successfully. The case, which is mentioned in the *Revue des Maladies de l'Enfance*, was as follows: The patient was a well-developed girl aged 9. She complained of having suffered for two years with severe abdominal pains, and stated that the tumor had been gradually forming ever since that time.

The circumference of the abdomen over the navel was sixty-two centimetres, and a little lower down was sixty-four centimetres. On palpation the tumor was found to be more on the right side, and constituted two large movable masses; there was no fluctuation. The uterus was only slightly developed, and the vagina only eight centimetres long. The author's diagnosis was ovarian cyst with a long neck.

Laparotomy and puncturing were first performed, after which the tumor was extirpated, the neck being ligatured. Healing was rapid. The tumor, with the liquid which it contained, weighed two thousand grammes. The little patient recovered.

SAPONIN AND SAPOTOXIN.

Quillaya saponaria was recommended by PROFESSOR KOBERT as a cheap and efficient substitute for senega, and has since been employed with good results by Goldschmidt, by Maslovski, chief of Professor Kuznet's clinic, and by Dr. Pachorukow, of Dorpat. The last-named observer has just published some account of a principle named by Professor Kobert "sapotoxin," which is contained in quillaya, and also forms part of the preparation sold as saponin, which appears, according to Dr. Pachorukow, to be a mixture of this substance, which is of a toxic character, and of another, lactosin, which is harmless. Sapotoxin has a powerful action on the blood, destroying the red corpuscles and decomposing the oxyhæmoglobin, thus interfering with the absorption of oxygen and causing death by asphyxia.—*Lancet*, December 24, 1887.

TREATMENT OF ACUTE BLENNORRHŒA WITH ALKALINE INJECTIONS.

It has been remarked that the gonococcus thrives in acid mediums, whereas it soon dies in alkaline. The question immediately arises as to whether it would not be plausible to treat gonorrhœa or blennorrhœa accordingly. The *Arch. Méd. Belges* (and *Medicinisch-Chirurgische Rundschau*, November, 1887) speaks of the experiments of DR. M. A. CASTELLAN, which were based upon the above hypothesis. Dr. Castellan treated twelve patients with injections of an eight to ten per cent. solution of bicarbonate of sodium three or four times daily. In about a week the discharge had become entirely alkaline in reaction, and from that time it lessened rapidly and soon ceased entirely. In old cases where all the usual remedies had been used without success, its use led to a rapid and complete recovery.

COCA ALKALOIDS.

The further elucidation of the chemistry of the coca alkaloids, furnished by DR. HESSE'S papers on this subject, is in many respects a useful contribution. There can now be but little doubt that cocaine is naturally associated with other bases, and that since one of these at least, though isomeric with cocaine, is an uncrystallizable substance forming uncrystallizable salts, there is on the face of the matter much reason for thinking that it ought to be separated from cocaine preparations intended for medicinal use, unless it can be satisfactorily shown that its physiological action is identical with that of cocaine. Unfortunately, that is a point in regard to which Dr. Hesse has not given much information, and notwithstanding the minute chemical descriptions given of both cocamine and cocaidine, he says nothing to indicate that either of these substances possess the same anæsthetic power as cocaine. Another point in which Dr. Hesse's papers on the amorphous alkaloids of coca-leaves fall short of being so instructive as they might have been, is the absence of any description of the means by which he found it easy to separate those bases from cocaine. Most other experimenters have found considerable difficulty in effecting such separation. As regards the volatile base obtained by Dr. Hesse from coca-leaves, and considered by him to be the same as that to which Lossen gave the name of hygrine, there appears to be some room for doubt as to whether it should be regarded as a normal constituent, or as a product of the alteration of some one of the bases naturally associated with cocaine. The nature of the volatile base he obtained also lends probability to the view that it may be a product of decomposition, as its homologue chinoline is in some instances, and the great liability of cocaine to undergo alteration may probably be shared by the other bases accompanying it.—*Pharmaceutical Journal and Transactions*, December 3, 1887.

IMPURE LANOLIN.

The *Revue Générale de Clinique et de Thérapeutique* of December, 1887, speaks of a case of acute dermatitis resulting from the use of impure lanolin. The patient was suffering from a syphilitic testicle, accompanied by swelling of the scrotum and penis.

It was first thought that the accident might be due to some other cause, but none could be found. The idea of a possible idiosyncrasy for lanolin was of course not taken into consideration. The patient had been using a salve of iodide of potassium, the base of which was lanolin. The inflammatory symptoms soon became very severe. Finally the salve was examined and the lanolin found to be rank and acid. This case should be a warning to practitioners, and make them particular as to the purity of the lanolin which they use or prescribe. Many inferior compositions bearing the name of lanolin are on the market and should be avoided.

In the case in question the symptoms of inflammation lasted for several weeks.

INFLUENCE OF SALICYLIC ACID ON THE EXCRETION OF URIC ACID.

At a meeting of the Royal Medical and Chirurgical Society, MR. ALEXANDER HAIG read a paper on the "Influence of Salicylic Acid and its Salts on the Excretion of Uric Acid" (*Lancet*, January 14, 1888). In a paper read before the society in May, 1887, the writer has shown that a certain form of headache is accompanied by a very large excretion of uric acid. And in a subsequent paper in the *Journal of Physiology* he has attempted to show that within certain limits it is possible to increase or diminish the excretion of uric acid at pleasure, by means of acids and alkalies; that alkalies always increase and acids always diminish the excretion. And, further, he has shown in the same paper that the above form of headache may be cured, and the large uric acid excretion which accompanies it may be stopped by a dose of acid. Salicylic acid, however, forms an important exception to the above statement, for while it increases urinary acidity it does not in any way diminish the excretion of uric acid. Further, acids given while salicylates are present in the circulation have no longer the power of diminishing the excretion of uric acid. This action of salicylic acid and salicylates forms the subject of the present paper, and is of great importance in explaining the value of these drugs in gout, rheumatism, and other diseases connected with uric acid. Figures are given to illustrate the excretion of uric acid under salicylates, and are contrasted with others showing the normal relation to acidity. Excessive excretion of uric acid taking place under salicylates is not accompanied by any headache, and salicylates have previously been found useful in this headache. The action of acids and alkalies on uric acid excretion is probably due to the fact that alkalies increase and acids diminish its solubility, and the same with the exceptional action of salicylic acid; for salicyluric acid, which it is supposed to form, differs from uric acid in being very greatly more soluble in water, and probably also more soluble in dilute acids. Benzoates do not act in the same way as salicylates, probably because hippuric acid, which they form, is less soluble than salicyluric acid. Extracts were given from Watt's "Dictionary of Chemistry" on the solubilities of these bodies. Both uric and salicyluric acids are present in the urine passed under the influence of salicylates; this is possibly due to the salicylate acting on the uric acid in the blood, and not on the uric acid which is excreted direct from the kidney. (See paper in *Journal of Physiology*.) Headache is present with the rush of uric acid which takes place under alkali, but not with the rush under salicylates; possibly, therefore, under salicylates, uric acid is present in the blood in a different chemical combination (salicyluric acid). Several chemical points with regard to salicyluric acid require further investigation, but it is difficult to obtain it in a state of chemical purity; but the facts now brought forward explain a great part of the value of salicylates in disease.

DR. WARD said he could corroborate the increase in specific gravity of the urine at the time of headache. This headache was associated with gout, and, if successfully treated by acids, it seemed the alkaline treatment of gout might with advantage be altered. Excessive exercise and meat-eating certainly increased the headaches. In France but little meat was eaten; yet headaches were very common. More mental work increased migraine, and this would show that it depended on more than mere excretion of uric acid; there was a nervous element; straining the eyes could induce an attack. Strychnine and aromatic spirits of ammonia were valuable drugs in megrim.

DR. A. GARROD said that, if the teaching of the paper was right, the salicylates ought

to have most marked action in gout, yet their influence was trifling. They gave relief to rheumatic gout, with which uric acid had nothing to do, nor with the pathology of rheumatic fever, in which the blood showed no excess of uric acid.

DR. HAIG, in reply, said that he could induce headache by the ingestion of agents believed to increase the formation of uric acid. It was in the intervals of the headaches that diet and regimen were so successful. The nervous system was debilitated in women, but they even would be better for leaving off the meat. The French drink a large quantity of acid wines, causing retention of uric acid. Exercise increased the output of uric acid through the perspiration. He believed that uric acid is the irritant that caused the headache, which was predisposed to by the state of the nervous system. In chronic gout salicin was useful, but in acute gout the salicin would come too late. It was Latham's theory that uric acid was operative in acute rheumatism.

THERAPEUTIC ACTIONS OF THE FRUIT OF THE MYROBALAN.

An interesting and exhaustive article on myrobalans, entitled "Le Myrobalans Remède Héroïque des Diarrhées, Dysenteries, et Cholerines," by PIERRE APÉRY, has recently been published by Librairie Baillière et fils, of Paris.

The author gives a complete history of the drug. It was well known in ancient times, as Matthiolus refers to it, and speaks of the dose. The Greeks seemed to have given other drugs the same name, as the name myrobalane (*μῦρον*, *βαλανος*) implies. What we understand to be myrobalan is the same as that which Arabian physicians had incorporated into their pharmacopœia.

Actuarius knew the drug, and Iben-Zohar, the physician to King Mensor, of Morocco, used it in eye-diseases. J. Mésne de Khorassen and Avicenna introduced numerous preparations of this remedy. N. Lemerry, in the *Pharmacie Universelle* (Paris, 1716), praises it as a "purgative cholagogue of great value in jaundice, diarrhœa, and dysentery."

Apéry then gives a long list of all the preparations which contain myrobalan, among which appear numerous pills, powders, and confections which all have a greater or less historical interest. Turks and Persians still use many of these preparations with good results. The ancients ascribed a laxative action to the drug, which was said to be followed by constipation. Baumé,* in speaking of the decoction, remarks that if the fruit be boiled for a short time only it will act as a laxative, but if boiled or cooked for several hours the action will be constipating. Aspéry tells of numerous experiments which he made with the Indian (black) myrobalan, the action of which is supposed to be stronger than others. The fruits are usually roasted, and, under the influence of heat, gradually increase in size until they have attained twice their original volume. In this state they are the color of roasted coffee, can be easily powdered, have a sour taste, give a greenish color to food, but remain odorless. In water or weak alcohol a large amount of tannin is dissolved. If the fruit be cooked with chlorate or sulphate of iron a black ink will be formed, which is as intense and as lasting as gall-apple ink.

Besides tannin, an oily, resinous, green body is found in the myrobalan, which withdraws soluble substances from alcohol, ether, and oil of turpentine. Apéry calls this body myrobalin.

Myrobalin does not give any characteristic reactions with the common reagents; it dissolves in nitric acid with a red coloring. If ammonia is added to the watery solution an intense orange-yellow coloring will appear. The same reaction is, however, observed if a few drops of ammonia be added to a solution of tannin.

The amount of the extract contained in Indian myrobalan is from thirty-five to forty per cent. The extract is light brown in color, and has a biting and slightly sour taste. The preparations of the drug are the extract, powder, pills, fluid extract, syrup, elixir, and wine. The action of the roasted fruits is almost solely due to the presence of tannin, although the myrobalin, which is not entirely eliminated by the heat, acts upon the digestive system, and especially upon the secretion of gall.

When 1- to 8-gramme (15 to 120 grs.) doses of roast myrobalans were given daily, cases of dysentery, diarrhœa, and cholerine were cured, as if by magic, in three or four days, after all other remedies usually employed in such diseases had failed. Numerous practitioners, at the suggestion of Apéry, tried the drug both in hospital and private practice, and the results it produced were remarkable. In dysentery, diarrhœa, chronic catarrh of the stomach, etc., both in old persons and children, myrobalan never fails to lessen the

* Elements de Pharmacie. Paris, 1773.

purging immediately. It also causes a marked decrease of peritoneal fluid, and causes ascites to disappear almost entirely. In some cases copious tuberculous expectoration was relieved. The secretion of urine was increased and beneficial action was observed in hemorrhoids and even in albuminuria.

The drug was usually given in pill form, or in powder for children who could not swallow the pills. From four to twelve pills were given at a dose. No unpleasant effects were ever observed to follow its use. In all cases the action of the drug was prompt and certain, and gave great satisfaction.

The botanical name of the plant which yields the myrobalan fruit is *Phillanthus emblica*, and it belongs to the Euphorbiaceæ.

SOMNIFERIN.

Somniferin is the name given to a new morphine-ether which was first discovered by E. Bombelon, and is claimed by him to be superior to morphine. Smaller quantities can be used with similar results, headache never follows its use, constipation is seldom observed, and the heart is not affected. The drug is a transparent, colorless crystal, and is easily prepared. Bombelon has also discovered several new alkaloids, which he has produced from the same source. Morphine-eserine, which contracts the pupil without pain; also chinintropine and morphinotropine. According to Bombelon a vast number of new bodies can be produced from the same source by means of various alkaloids; they retain both the chemical and physiological actions of both alkaloids, or, in some cases, contain new properties.

Physiological experiments with these bodies are being actively carried on.—*Der Pharmaceut*, December, 1887.

PHOTOXYLIN IN PERFORATION OF THE TYMPANUM.

The methods usually employed in the treatment of persistent perforation of the tympanum usually meet with negative results, so that the want of a method that will meet all requirements is keenly felt. It is the physician's duty not only to check the discharge in otitis media but to guard against its return by closing any perforations of the tympanum. This seldom, if ever, occurs spontaneously. In some cases the closing of the perforations causes an increased difficulty in hearing. In such cases an artificial tympanum should not be used, and the perforations allowed to remain open. However, this should be done when the tympani of both ears are perforated, and the closing of them prevents good hearing. When only one ear is perforated, the lessening of hearing should not deter the operator from attempting to close the perforations, providing, of course, that the other ear is sound.

A certain preventive against the return of suppuration is of far greater importance to the patient's health than a slight difficulty in the hearing of one ear.

The methods usually employed in treating persistent perforation have been touching with nitrate of silver, the galvano-caustic treatment of Schwartze, and the numerous little incisions recommended by Gruber, etc., and it must be confessed that all these have been far from satisfactory. The same must be said of the myringoplastic operation recommended by Berthold. The practice of using the thin membrane of a chicken's egg as an artificial tympanum is worthy of trial, as the results of this operation are frequently very good. In the *Monatschrift für Ohrenheilkunde* a case was reported where the entire tympanum had been destroyed, and where the artificial tympanum, which was the egg-skin of a chicken, grew fast to the cavity of the ear-drum, and this formed a new tympanum. But even this method has its drawbacks, as it is not borne by some patients, in whom the egg membrane acts as a foreign body in the ear, and gives rise to irritation, inflammation, and finally a return of the discharge. In other cases the placing of the membrane is a matter of great difficulty, and is not always followed by an improvement in hearing.

Dr. L. Guranowski, of Warschow, writes to the *Monatschrift für Ohrenheilkunde* (November, 1887) of a new and original method of closing perforations of the tympanum. It is simply that the edges of the perforations should be touched and retouched with photoxylin until the entire opening is closed. Photoxylin, which is prepared by many firms for photographic purposes, is recommended by Dr. S. Krysinski as a substance in which to imbed microscopical preparations. Professor E. von Wahl, of Dorpat, as already stated in the Gazette, has found photoxylin to be very valuable in dressing wounds after operations.

Dr. Guranowski used the drug in a twenty per cent. solution. His manner of application was as follows: First the ear was washed

out with a solution of boric acid by means of a syringe, and afterwards very carefully and thoroughly dried with absorbent cotton; then, by means of a camel's-hair brush on a bent wire, the edges of the perforation were painted with photoxylin. After the first application, the operator should wait for about ten minutes or so, until it has "set" or dried; then another application should be made on top of the first one, on the inner edge of the perforation; this should also be allowed to dry; and so on one application after the other should be made until the perforation is entirely closed. The photoxylin will form a transparent elastic membrane of considerable strength, which does not break when pressed with a sound or when inflation is used. So far as Dr. Guranowski has observed this membrane will last for several months.

In every case operated upon the result was successful, although in two cases the hearing was not improved. In no case did the discharge reappear.

THE USE OF CALOMEL IN THE PREVENTION OF PITTING IN SMALL-POX.

In order to prevent the forming of pustules, or the disfiguring marks, on the face in smallpox many methods have been recommended, but none can boast of sure and successful results.

Among the remedies which have gained great reputation may be mentioned the application of indifferent fats, collodium, tincture of iodine, a solution of carbolic acid or of corrosive sublimate, also cutting of the pustules and cauterizing them by nitrate of silver, and, finally, various forms of masks on the face, or continual cold compresses. Although the latter would seem to give the best results, it cannot be always employed, either because not everybody can support cold compresses, or because this application is troublesome to make, as it requires constant attention.

Having frequently had such cases under his care during a recent epidemic of smallpox at Warsaw, DR. JOSEPH DRZEWIECKI, in a letter to the *New York Medical Record*, January 21, 1888, states that he has convinced himself that calomel, applied as a powder on the face, does not prevent the development of vesicles from the papules; but when vesicles or pustules were developed it caused them almost immediately to dry up, and in this manner prevented the formation of marks. How and why calomel acts in these cases the author does not pretend to explain. However, we may suppose that possibly several agents have a share in producing this result. Perhaps the calomel acts partly as calomel, partly as sublimate, or partly, perhaps, as metallic mercury, since calomel becomes decomposed into these two latter substances under the action of light; and the mercurials then act either by immediately destroying the micro-organisms or by preventing their development.

In his cases he employed calomel alone, in the form of powder, dusting it over the face, or mixed it with starch in the proportion of twenty to thirty per cent. The author supposes that, instead of calomel, the oxide of mercury might also be employed with success. As regards the strewing of calomel into the eyes, sometimes adopted with a therapeutic aim, we need not fear that it will do them any injury.

THE INFLUENCE OF THE PNEUMOGASTRIC NERVE ON URINARY SECRETION.

According to the Paris correspondent of the *Brit. Med. Journ.*, January 21, 1888, MM. ARTHAUD and BUTTE communicated to the Société de Biologie, at the meeting of December 17, a paper on the effects of faradization of the right pneumogastric nerve on urinary secretion. The authors, in order to obtain the above effects by purely physiological means, administered curare to animals until they became motionless; then, by means of induction currents, gradually increasing in intensity, they successively excited the entire pneumogastric, and then its peripheral end after being cut. The quantity of urine eliminated was measured by comparing the column of urine running, in a given time, through a long horizontal capillary tube fitted to the right ureter. The first experiment was on a sheep-dog, which had received an injection of .03 centigramme of curare. In a normal condition, the urine runs through a length of tube equal to four or four and one-half centimetres in five minutes. During stimulation of the right pneumogastric by a very weak current, the above length was reduced to 2.8 centimetres in the same time; when the current was a little stronger the length was further reduced to 1.4 centimetres. The pneumogastric was then cut, and the peripheral end on stimulation with a feeble current gave a normal figure,—four centimetres.

With a stronger current, the length fell to three centimetres, and when the current was raised to its maximum the urinary secretion almost completely ceased. When the current was stopped, the secretion was restored to its normal condition. The experiment lasted two hours, and the animal was then killed. The kidneys, examined under the microscope, showed small red spots in the cortical substance. The urine passed during the experiment was clouded, pale, slightly albuminous, and contained blood-corpuscles, and perhaps some epithelial cells. A second experiment on another dog gave similar results. Experiments on other dogs, without injection of curare, but with application of mechanical pressure or the use of chloroform, did not give such definite results. The authors conclude that the right pneumogastric has a distiuct action, through its peripheral branches, on urinary secretion.

SODIUM SULPHIBENZOATE.

Still another compound has been added to the group of antiseptics, under the name of "sodium sulphibenzoate." It is described by M. HECKEL (*Compt. Rend.*, cv. 896) as being prepared by dissolving sodium benzoate in a strong solution of sodium sulphite, and was, in fact, the outcome of an attempt to combine the antiseptic properties of these two salts. The chemical and physical properties of the compound are not mentioned, beyond the statement that it is very soluble in water at the ordinary temperature; it is also affirmed to be absolutely innocuous to the human organism in large doses. But its antiseptic properties are declared to be very considerable, it being reported, as the result of clinical experiments in the hospital of Saint Mandreer, that a solution of sodium sulphibenzoate, in the proportion of four or five grammes to a litre of water, used as an application to wounds, is superior to carbolic acid, and comparable in its good effects to the salts of mercury without their toxicity, or to iodoform without its disagreeable odor.—*Pharmaceutical Journal and Transactions*, December 3, 1887.

PROFESSOR SÉE ON DISEASES OF THE STOMACH.

For the last few years the diagnosis of the diseases of the stomach, which appeared to be so well established, has entered a phase surrounded with difficulty and uncertainty. It has been found that the traditional methods of exploration, palpation, percussion, and the information furnished by patients, presented only probabilities. Such were the prefatory remarks made by PROFESSOR GERMAIN SÉE to a long communication he read before the Academy of Medicine last week (*Lancet*, January 28, 1888). About eight years ago, in his treatise on the different forms of dyspepsia, the learned professor showed that all maladies of the stomach that were not organic belonged to the class of dyspepsias, and that these latter affections were purely of a chemical order. It is, therefore, necessary that, in all maladies of the stomach, the chemical composition of the gastric juice should be examined. It is thus that he ascertained that in cancer of the stomach hydrochloric acid is always diminished in quantity or altogether absent. He attaches the greatest importance to this sign, as he considers it almost pathognomonic of cancer of the stomach. In presence of this fact, after having given a full trial to the different tests employed till now for such a purpose, Professor Sée has found that the flucoglycinate of vanillin is more certain and more expeditious than all the others. When two grammes of the fluco-glycinate of vanillin are dissolved with one gramme of vanillic acid, one drop of this solution is sufficient to reveal the smallest trace of the presence of a concentrated mineral acid. As the flucoglycinate of vanillin acts only on hydrochloric acid, the mixture is immediately tinted of a bright-red color, and at the same time crystals of the same tint are precipitated. Concentrated organic acids—for example, lactic acid or acetic acid—have no influence whatever on the coloring. Even the chlorides mixed with these acids produce no coloring whatever. To obtain the gastric juice, Professor Sée employs Potain's aspirator, with which aspiration is practised forty-five minutes after a patient has ingested two hard-boiled eggs and drunk half a tumbler of water. By this means cancer of the stomach, which is always accompanied by a considerable diminution or absence of hydrochloric acid, may be diagnosed, though this condition may be found in certain forms of dyspepsia, named "mucous," and particularly those which result from inanition, marasmus, etc. From the above facts, the therapeutic indications may be reduced to three,—"chlorohydrotherapy," "alkalinotherapy," and mechanical and physico-chemical evacuants. Professor Sée remarks that in his experience

hydrochloric acid is rather too indiscriminately employed in dyspepsia, as there are some cases in which there is a hypersecretion of hydrochloric acid, which certainly is clearly a contraindication for the administration of this substance. The quantity of acid present can only be ascertained by the introduction of a stomach-tube. The veritable domain of chlorohydrotherapy is dyspepsia,—that is, where the acid is in small quantity, or where the organic acids predominate. It is, therefore, indicated in mucous dyspepsia or in dilatations of the stomach. Alkalinotherapy is not discussed. The author finds that in general the dose of the alkaline employed is too feeble, and, as the object is to neutralize the excess of acid, alkalies should be freely administered. Evacuants are applicable to all the cases of atonic affections of the intestines and of the stomach. As regards diet, there are two articles which are commonly used with so little discrimination that they are believed to be really useful and applicable to every patient suffering from dyspepsia; these are milk and raw or underdone meat. The former is prescribed *urbi et orbi*, and has become the general panacea for all affections of the stomach, even including dilatation, and as the quantity of milk taken is generally very great, this abnormal condition must necessarily be aggravated. It is only in ulcer of the stomach that milk is indicated, for even in cancer of that organ milk would be injurious, as it is not digested. The indiscriminate use of meat is also very injurious. In the cases where this is employed, vegetables, bread, and farinaceous substances are generally suppressed, much to the detriment of the patient in many cases. The total suppression of an amylaceous diet, as is generally recommended in the above circumstances, is altogether unjustifiable, and particularly in cancer of the stomach where there is total absence of hydrochloric acid, in which case an amylaceous diet, which would be at the same time nitrogenous, would be incontestably useful. Inversely, the amylaceous diet should be severely forbidden in all cases of dyspepsia resulting from a hypersecretion of hydrochloric acid, as the excess of this acid may determine spasm of the pylorus and retain the amylaceous substances in the stomach, or cause exaggerated contractions of its muscles, which would hasten before the time required the expulsion of the aliments incompletely transformed. In these cases fish may freely be taken, and meat of all kinds, and even ham may be found useful.

HYDRATE OF AMYLENE AS A NARCOTIC.

Dr. Georg Avellis, of Giesen, has been recently using hydrate of amylene as a narcotic with very good results. He has used the drug in three hundred different cases, and prefers it to chloral. It is given in solution (1 to 10) in single doses of 2 to 2.4 grammes (31 to 37 grains); to persons who are accustomed to the use of narcotics doses of 4 grammes (about 1 drachm) may be given. The action of the drug is the same whether it be given *per os* or *per anum*. There is no period of excitement. The sleep produced by amylene-hydrate is light and refreshing, from which the patient is easily awakened. There are no unpleasant after-symptoms, such as headache, dulness, or nervousness, and the digestive organs are not impaired by its use. In one case of hysteria, ringing in the ears and dizziness were experienced. In a case of delirium in erysipelas, one of psychosis, and one of severe neuralgia the drug seemed to have no effect whatever. It was used with success in cases of stomach and nervous diseases, in circulatory disturbances, in icterus, cholelithiasis, chrysarobin dermatitis, diabetes, tuberculosis, emphysema, bronchitis, etc. In affections of the respiratory organs it did not increase coughing.—*Centralblatt für Nervenheilkunde*, Leipzig, February, 1888.

TRANSPERITONEAL NEPHRECTOMY.

Dr. F. Terrier, professor in the medical department of the University of Paris, has recently published a most interesting article on the operation of transperitoneal nephrectomy, which appeared in the *Revue de Chirurgie*, No. 5, 1887.

Dr. Terrier is of the opinion that the operation is capable of great improvement; the results of the operation are good. Langenbuch and Thornton suggested this method of operating, which the author also considers to have special advantages.

The operation is as simple as it is effective: the affected kidney and hilus are easily reached. It has, however, one serious drawback, for after the kidney has been removed there remains a large retroperitoneal cavity into which fluids are gathered which could give rise to peritonitis. Therefore the drainage of this cavity has always been considered absolutely necessary. Le Dentu, in his interesting work on the "Technic of Nephrectomy," also lays stress upon this point. Spencer Wells recommends suture of the

peritoneum, which Terrier also deems advisable when drainage is used. Terrier, however, considers that drainage through the lumbar region is unnecessary. He has found another method of treating this retroperitoneal cavity, which seems to fill every requirement of the operator. The author has used this mode of operating in two cases. In one the result was very satisfactory, but the other case terminated fatally, the patient dying with symptoms of uræmia: the other kidney was also found to be gangrenous.

Terrier's *modus faciendi* is as follows:

The incision should be made in the rectus abdominis muscle directly over the outer edge of the kidney, or else in the median line; the latter is preferable unless the diagnosis is absolutely certain. Access to the peritoneal cavity having now been gained, the bowels should be pushed aside and the peritoneum cut through at the back of the tumor. Care should be taken to avoid larger vessels if possible. The edges of the peritoneum should then be drawn back by pincettes and the tumor drawn out with the finger or by means of some blunt instrument. Spurting vessels should be carefully ligatured. If the tumor is a cyst it should be emptied by puncturing before removal, so as to reduce the volume of the tumor as much as possible, and thereby to facilitate enucleation.

When the base or stem of the tumor has been reached, it should be caught with "compression-pincettes" and the tumor removed. After the ligatures are all in place the cavity should be carefully washed out with sponges. The wound of the peritoneum should then be closed with catgut sutures, then drawn forward and fastened to the abdominal wound; the latter should previously have been made smaller by deep sutures. In this way the large peritoneal cavity is closed, and also isolated from the cavity which was occupied by the tumor. The secretions may now be easily drained off by means of drainage-tubes. Of these two large ones should be used, which should be made antiseptic with powdered iodoform. An iodoform dressing should then be applied to the abdominal wound, which should be covered by a carbolized and waterproof bandage, and held in place by means of carbolized cotton and a flannel bandage. If the stump of the ureter has been left in the cavity of the wound the drainage should be kept up as long as possible, but if the stump has been fastened to the mouth of the abdominal wound, the drainage-tubes should be removed on the tenth or twelfth day.

In speaking of the advantages of the operation, Terrier says,—

1. Transperitoneal nephrectomy is often advisable, particularly in large tumors of the kidneys.

2. It facilitates enucleation, the hilus is easily found, and renders the treatment of the ureter and vessels easy.

3. The operation does not necessitate lumbar drainage, as has been so often stated.

4. The practice of joining the suture of the peritoneal orifice with the abdominal wound is of great value.

5. The drainage-tubes, which should reach well into the retroperitoneal cavity, must not be removed too soon, especially when the asepsia of the ligatured ureter is uncertain.

6. One should always endeavor to bring the stump of the ureter forward and fasten it on the outside of the wound, so as to be able to treat it separately.—*Medicinisch-Chirurgische Rundschau*, September 15, 1887.

A NEW METHOD OF TREATING POTT'S FRACTURE.

In the condition known as Pott's fracture the displacement which occurs is twofold,—viz., (*a*) outwards and (*b*) backwards. The first of these deformities is universally recognized, but the second is often overlooked, because the ordinary method of putting up this fracture (in back and side splints) hides the displacement backwards whilst the apparatus is on, although it does but little to remedy it, so that when the patient begins to walk he finds that his progression is considerably impeded. An examination of the foot in such a case will show that the heel is much more prominent than it should be, that the concavity of the tendo Achillis is increased, and that the foot, if measured from the anterior margin of the lower end of the tibia to the end of the big toe, is found to be shortened.

The ordinary method of treating Pott's fracture by back and side splints is unsatisfactory, because (*a*) considerable difficulty is found in correcting the outward displacement of the foot, necessitating constant rearrangement of the side-splints, and (*b*) the backward displacement is not adequately affected unless so much backward pressure is made on the ankle as to incur the risk of a sore heel. To get over these difficulties Cline placed the limb on an outside splint (known as Cline's splint) and flexed the knee so as to relax the calf muscles. This method answers

very well as far as the outward displacement is concerned, but has hardly any effect on the backward one.

To remedy the latter DR. E. W. ROUGHTON (*Lancet*, December 10, 1887) has adopted a modification of Cline's method. The splint used is an outside splint with a foot-piece padded thickest where the foot-piece joins the other portion of the splint. Three bandages are fastened by means of safety-pins, one at the ankle passing from the instep of the splint below the ankle and turning round the heel; the second placed just above the ankle, and likewise being turned towards the heel; while the third is placed just below the knee, and turned in the opposite direction over the calf of the leg. The injured limb having the knee flexed is then laid upon the splint so that the outer edge of the foot is well supported by thick padding, and then fixed by the bandages, one being first applied above the other. The upper bandage passes backwards between the limb and the splint, then turns forward around the back of the limb and makes traction forwards, and it is then fixed by a pin, the other bandages being tightened at the same time. The middle bandage passes forward from the back of the splint between the splint and the limb, and then turns over the front of the leg and pulls backwards. The lower bandage is the most important one, and passes from before backwards between the splint and the limb, turns over the point of the heel and pulls forwards and downwards. The two lower bandages are wrapped once around the limb and splint and then fastened with safety-pins. Usually, in forty-eight hours the heel bandage will require to be tightened, owing to relaxation of muscular spasm. When bruising has subsided and a sufficient amount of union taken place, this apparatus is removed and the limb put up in a silicate bandage, taking care to keep the foot well adverted and at right angles to the leg. Dr. Roughton states that he has found this method of treating Pott's fracture very simple and efficient, the foot and ankle eventually being as useful and shapely as before the accident. The great advantage of the whole bandage is that it exerts a uniform and elastic pressure in the direction required, and never produces that unfortunate result,—a sore heel.

A CASE OF IODOFORM-POISONING.

La Pratique Médicale of November 29, 1887, adds another case to the list of iodoform-poisonings. DR. BOLOWSKI tells of the case, which was one of chronic endometritis. Iodoform had been inserted in the uterus in the shape of suppositories after the operation. The quantity used had been very small, amounting only to seventy-five centigrammes (one and one-sixth grains). In three hours symptoms of poisoning became manifest: nausea, vomiting, small irregular pulse which was scarcely perceptible, convulsive respiration, photophobia, and general excitement. The presence of iodoform was traced in the urine. On the second day the delirium still continued, pulse 120, clonic convulsions of the face, fingers, and toes, cold extremities, mydriasis, cutaneous eruption, ischuria, and icterus. There were no particular local symptoms. On the fourth day the symptoms of poisoning began to disappear, the amount of iodoform in the urine gradually diminished, and recovery resulted after some time.

Dr. Bolowski considers that the symptoms of poisoning were due to an idiosyncrasy of the patient to iodoform.

ERGOTIN INJECTIONS.

In an article which recently appeared in the *Centralblatt für Gynäkologie* (November 26, 1887), DR. B. LILIENFELD, of Einbeck, speaks of his experiences with ergotin used hypodermically. Inflammatory and irritative symptoms have been frequently observed to follow the hypodermic use of ergotin. Some time ago Dr. Bumm wrote an extensive treatise on the technic of ergotin injections, and recommended weak neutral solutions of the drug.

Dr. Lilienfeld's results are still more valuable, and his conclusions are not alone based upon personal observation, but also upon the experiences of his colleagues.

He holds—1. That the injection should not be made in the abdominal wall, but directly into the muscles of the back or hips. 2. That the solution should be made at the bedside, immediately before using the injection, still better if the solution be made in the syringe. The author lays great weight upon this point, as he contends that freshly-made solutions are absorbed with far greater rapidity than others. 3. The best preparation of ergotin seems to be that of Bombelon, and the strength of the solution 2 to 8 parts of

water. Other preparations, however, have also been used with equally good results. 4. Sharpness and perfect cleanliness of the needle are indispensable and of great importance. 5. The injection should not be made in the skin, but the needle inserted until it may be moved freely under the cutis, and the solution then injected.

In conclusion, the author cites numerous cases which go to prove the value of the above suggestions. In one case, of a woman suffering from myoma of the uterus, one hundred and forty injections were made in four months without occasioning any irritative or inflammatory symptoms.

MEDICAL AND SURGICAL TREATMENT OF GALL-STONES OBSTRUCTING THE INTESTINES.

The meeting of the Clinical Society of London, held on January 13, was devoted to the consideration of the medical and surgical treatment of gall-stones obstructing the intestines, the discussion being opened by DR. MACLAGEN. He read notes of two cases of obstruction of the bowels by large gall-stones (*Lancet*, January 21, 1888). In the first case, between the middle of July and the 6th of April, the patient had four different attacks, each lasting from three to six days, all characterized by acute griping pain in the abdomen, sickness, nausea, and temporary obstruction. About a fortnight after the last attack the patient voided at stool first one, then another, then a third, and two days later a fourth gall-stone. The stones averaged about an inch in diameter. (Stones shown.) During the whole illness there existed a tumor about the size of the fist between the umbilicus and the liver, just to the right of the middle line, in the region of the gall-bladder. After the stones were voided there was no more severe pain, but constant nausea. The liver increased much in size all over, and very rapidly. The patient gradually sank and died. On post-mortem examination the liver was found to be very much enlarged and fatty. The gall-bladder communicated with the duodenum by a free opening. There was much inflammatory thickness all round. A fifth gall-stone was found in the remains of the gall-bladder. In the second case there was a swelling the size of a hen's egg in the region of the gall-bladder, tender on pressure. This suddenly decreased in size. Immediately succeeding this diminution there were developed symptoms of acute intestinal catarrh, followed in a few days by those of intestinal obstruction. The obstruction lasted for three weeks, and was then relieved. Treatment was by morphine and nutrient enemata. The patient gradually improved, and went on doing so for six or seven weeks, after which she again had recurrence of the old symptoms, with renewed obstruction, lasting for a fortnight. A third attack supervened. At the same time the temperature rose, and marked tenderness was developed over the region of the liver. The patient gradually sank and died. No post-mortem was obtained. After the first attack was over there was felt to be something in the right iliac fossa, causing tenderness on firm pressure, and preventing one from getting the hand freely into the fossa. This continued for a fortnight. The tenderness then disappeared. The hand could be pressed into the fossa. At the same time a hard lump was felt just above the crest of the right ileum. This was believed to be the stone, which had passed from the cæcum into the ascending colon.

MR. CLUTTON read a case of "Laparotomy for Obstruction from Gall-Stone" ending in recovery. This was a case of a woman of 70 years of age, in which the abdomen was opened on account of obstruction which was thought to be due to an impacted gall-stone. The calculus, being felt in the lower end of the ileum, was pushed through the ileo-cæcal valve. The patient was relieved of her symptoms and made a perfect recovery. Mr. Sidney Harvey, under whose care the patient had been for some years, was able to diagnose the probable presence of an impacted gall-stone from the fact that fifteen months before she had passed a large facetted biliary calculus, and from that time, as long as she remained under treatment, he was unable to find a tumor in the position of the gall-bladder. The symptoms of obstruction began, about twenty-four hours before the operation was performed, with sudden acute pain in the abdomen and vomiting. On examination, Mr. Harvey found that the tumor in the position of the gall-bladder had disappeared. The operation was undertaken at this early period on account of the age of the patient, the exhaustion that had already been induced, and in the hope that the stone, which was believed to be the cause of obstruction, could be pushed through the ileo-cæcal valve without opening the intestine. This proved to be the case, for the calculus was found close to the valve and movable. Some difficulty was ex-

perienced in pushing it through the ileo-cæcal valve in the colon; but, this having been overcome, the calculus was left to find its own way along the rest of the large intestines, and was passed naturally in five days after the operation. The calculus was pyramidal in shape, the base measuring three and three-tenths inches in circumference.

The PRESIDENT referred to a severe case of "Intestinal Obstruction" occurring in a woman 90 years of age, which proved fatal in a few days. He thought much encouragement was to be derived from Dr. Maclagan's first case; the disappearance of the swelling in the region of the gall-bladder when urgent symptoms appeared was important.

DR. ORD related three cases of "Intestinal Obstruction due to Gall-Stones;" the symptoms were generally violent in character. In the first case a stone was ultimately passed *per vias naturales*, and it resembled very much in size and character that shown by Dr. Maclagan. In another case, pain, vomiting, with signs of obstruction and peritonitis, led to a fatal issue; the stone was not larger than the top of the thumb, but yet tightly grasped by the inflamed tract of intestine; it had ulcerated through the gall-duct. In some cases the value of waiting and of the use of opium was conspicuous. In another case there were signs of acute obstruction in a lady at Isleworth; the surgeon performed laparotomy, and found an inflamed piece of intestine, but the gall-stone was not detected. In these cases there might be no history of pain or jaundice.

DR. GIBBONS related a case of "Biliary Colic," which subsided ten days before death. The sudden fatal issue was due to a gall-stone having ulcerated through the bowel, and was, he believed, a unique case of perforation of the bowel by a gall-stone.

MR. ARTHUR BARKER showed a large gall-stone removed from the ileum after death. It measured four inches in circumference. It had caused complete obstruction, and though it could be pushed upwards from its situation, it could not be forced downwards towards the valve. He considered that there would be no danger in performing laparotomy with a view to crushing the stone by means of a long needle, or even of opening the intestine, removing such a stone and suturing the bowel together after the approved fashion; such an operation could be performed with safety.

MR. HEATH spoke of the value of systematic manipulation in cases of colic due to renal calculus, and this might be carried out also in cases of intestinal obstruction due to gall-stone. The abdominal walls should be thoroughly relaxed by an anæsthetic, and the bowels should also be deprived of their contractility, so as to enable the massage to be thoroughly performed, and the stone so manipulated as to be moved onwards towards and through the ileo-cæcal opening. The results of operative interference were not very satisfactory.

MR. KNOWSLEY THORNTON spoke of the success of Mr. Clutton, obtained under very adverse circumstances, and he contrasted this with the tedious and anxious waiting of Dr. Maclagan's cases. It would be a good general rule to call for such surgical aid when serious symptoms persisted. He spoke with approval of Mr. Lawson Tait's method of crushing the gall-stone *in situ* by means of a pair of padded forceps, and thought that this method could be applied with but little risk to the stone in the intestine, provided that the stone were dislodged first into a healthy portion of intestine. Moreover, it would be possible by means of a long needle to fracture a large stone into fragments, and thus allow of each small fragment easily passing through the ileo-cæcal opening; the mere pricking of the intestine in a healthy part was of no consequence.

MR. GANT related a case in which a gall (?) stone had ulcerated through the vermiform appendix, and was found lying on the quadratus lumborum; this had caused rapidly fatal peritonitis.

DR. GLOVER referred to the free use of olive oil in the expulsion of gall-stones.

DR. MACLAGAN, in reply, said that his cases were some in which there was no previous history of pain or jaundice pointing to gall-stones. He could not believe that these gall-stones in the intestines travelled about, for in his own cases the tumor remained fixed to one place for many days.

MR. CLUTTON, in reply, said that he did not advocate laparotomy in all cases, but only in those in which there was but little chance of expulsion, and in those in which it would be perilous to delay an operation until the patient's strength was exhausted.

RESORCIN IN SEA-SICKNESS.

The number of specifics for sea-sickness is truly legion. All are reported to be absolutely infallible, but when put to the test are found sadly wanting in efficacy. Almost every transatlantic ship's surgeon has his "sure

cure," in spite of which sea-sickness still exists, and the number of patient sufferers is by no means on the decrease. That there are a number of drugs and prescriptions which relieve sea-sickness to a greater or less extent is undeniable, but so far no actual preventive seems to have been discovered. This DR. JUSTUS ANDEER seems to have found. As the doctor is an old transatlantic traveller his experiments have been of a personal nature, being himself a victim to sea-sickness. Dr. Andeer considers, says the *Centralblatt für die Medicinischen Wissenschaften* of December 10, 1887, that a single dose of .75 to 1.5 grammes (12 to 24 grains) of resorcin is usually sufficient to abort sea-sickness in its first symptoms, and a relapse is seldom observed.

As soon as symptoms of uneasiness, dizziness, loss of appetite, and restless sleep begin the drug should at once be taken. The result will be continued relief from all the above symptoms, and gentle, refreshing sleep.

In severer cases, where vomiting has set in, and added to the above-mentioned symptoms there is tremor, apprehension, a heavy feeling in the back of the head, and constipation, the drug should then be continued, and two or three doses given daily until entire relief is obtained. Every dose of the drug will be followed by a tranquil sleep, lasting from three to five hours, from which the patient will awake feeling refreshed and relieved.

In some extremely sensitive patients the symptoms of sea-sickness will return during a heavy sea, but a single dose of the drug will at once relieve these. Should the constipation continue, it may be relieved by capsules of castor oil and resorcin. Simultaneously with the use of the drug the digestion, etc., will become normal.

Nearly all the remedies used in sea-sickness often occasion digestive difficulties, but with resorcin this is not the case, as the most delicate stomach will tolerate it.

Only lately an investigator has stated that all aromatic remedies are injurious to the stomach. This statement may be modified in this way: all aromatic remedies are injurious to the stomach with the exception of resorcin.

FUCHSIN IN ALBUMINURIA.

In the *Gaz. Heb. de Méd. et de Chir.*, DR. REISS writes of twenty cases of nephritis which he treated with 5 milligrammes to 1 centigramme ($\frac{1}{10}$ to $\frac{1}{6}$ grain) of fuchsin. In two cases the effects were truly wonderful: the first was a case of scarlatinous nephritis in a child, aged 4; a complete elimination of albumen resulted in forty days. The second was a case of rheumatic nephritis, and in this case a cure was effected in three weeks. The other cases, among which were several cases of chronic nephritis, were all benefited greatly by the use of the drug.

Dr. Reiss considers the proper dose to be from 1 to 5 milligrammes ($\frac{1}{64}$ to $\frac{1}{10}$ grain) daily, and in special cases the dose may be increased to 10 or 12 milligrammes ($\frac{1}{6}$ or $\frac{1}{8}$ grain). A red coloration of the urine was noticed, but no cerebral, nervous, or digestive troubles were ever observed to follow the use of the drug.

ERYTHROPHLÆINE.

In connection with the original article of Dr. Lewin, published in another column of this number of the GAZETTE, the communication by MR. TWEEDY, in the *Lancet* for February 4, 1888, is worthy of notice. Mr. Tweedy states that during the last fortnight he has made many trials with solutions of the hydrochlorate of this drug on the human eye, but has failed to observe any decided anæsthetic effect. His first experiments were made with .5 per cent. solution, but this produced very severe pain and irritation, accompanied by ciliary injection, lasting from six to forty-eight hours, and a .25 per cent. solution produced only a degree less pain and irritation without discoverable anæsthesia, while a still weaker solution of .125 per cent., or 1 in 800, was also negative as regards anæsthesia. After many trials with a solution of this strength, he has been unable to obtain any appreciable anæsthetic effect. The immediate effect is severe smarting, lasting from ten to thirty minutes; and at any time from ten minutes to twelve hours after, the application of a minute drop of nitrate of silver or carbonic acid applied to the conjunctiva produced as much smarting in the eye to which the erythrophlæine had been applied as in the other eye. In other respects he states that the effect of the application is very disagreeable,—the sight is blurred, and around any artificial light there is a pronounced circular halo, with the red rays outwards, this being probably due to disturbance of the coroneal epithelium. Mr. Tweedy further contradicts Lewin in stating that instead of producing contraction of the pupil in all cases, there was wide, though not complete, dilatation. In the face of these opposite results, the only conclusion that suggests itself is that this drug has not yet been

obtained in a simple and definite form, or, at least, that there is more than one active principle present in the substance now in the market.

DIOXYNAPHTHALIN.

Dioxynaphthalin has the formula $C_{10}H_8O_2$; it has 2O more than naphthalin, and therefore is called the dioxide of naphthalin.

Dr. Lépine has recently experimented extensively with the drug. The dioxynaphthalin used by him was a glistening powder of a flaky appearance. It melts at 186° C., and is soluble in 100 parts of warm water. The difference between it and naphthol is that one volume of H of naphthol is substituted by one hydroxyl group HO. Stolmkoa affirms that the hydroxyl group increases the actions of the radical with which it is combined. Lépine also found that β-naphthol (the only one he tested) was weaker in action than dioxynaphthalin. .15 to .20 gramme ($2\frac{3}{10}$ to $3\frac{1}{10}$ grains) of dioxynaphthalin to every kilogramme (2 pounds) of the weight of a guinea-pig caused fatal epilepsy, whereas the same amount of β-naphthol, given under similar conditions, only produced slight twitching of the extremities.

In large doses dioxynaphthalin is poisonous. In small doses it acts as an active excitant on animals. In man it does not seem to affect the sensibility, does not increase either the reflex or muscular power, but considerably increases strength.

The amount used was 1 gramme ($15\frac{1}{2}$ grains) a day in four doses. When 2 grammes ($30\frac{8}{10}$ grains) were given, the patients complained of weakness. In the cases of two women 1 gramme ($15\frac{1}{2}$ grains) produced cyanosis.

There is also an analogy between the sthenic actions of β-naphthalin and dioxynaphthalin. But of the former the dose must be as large as 2 to 3 grammes ($30\frac{8}{10}$ to $46\frac{1}{3}$ grains), and this is not well endured by the digestive organs, as it irritates the mucous membrane of the bowels.—*Archiv. de Pharm.*, 9, 1887.

HERPES DIGITALIS.

A curious case of herpes digitalis is reported by Dr. A. Blaschko in the *Deutsche Med. Wochenschrift*, xiii. 27, 1887.

The case was that of a man, aged 30, who for two years had been suffering from attacks of the following nature: Every two to four months he would be seized with neuralgic pains in the right forefinger, which extended to the back of the hand and arm. These would gradually decrease, and in two or three days small, round, and painful swellings, or "prominences," would make their appearance on the right forefinger and on the radial side of the same. The skin surrounding these little swellings would be inflamed, and in the middle of each there would be one or two small blisters. If these were opened, they were found to contain a small quantity of a clear liquid; healing would soon follow, and large flakes of epidermis would often be cast off. If these blisters were not opened the swelling would continue and lymphangitis set in, which would continue, and spread to the glands under the arm, until the pustules were opened, whereupon healing would rapidly take place.

The duration of the entire attack varied with the number of the eruptions, which was always different. Upon microscopical examination, the contents of the swellings were found to consist of serum, a few round cells, and detritus, small conglomerate, necrotic rete-cells, but no pathogenic organisms.

Dr. Blaschko classes herpes digitalis with herpes labialis and herpes præputialis. He says that the affected nerves cause a minimal necrosis of the epidermis, which they supply, and that this gives rise to the eruption.

IODOL IN OTITIS MEDIA.

Dr. Ignaz Purjesz, of Budapest, has been recently using iodol in acute and chronic cases of otitis media. The drug was used in powder form, and insufflated into the ear. Before each application the ear was always carefully cleaned. From a number of cases which Dr. Purjesz cites we select the following two. In every case the results were similar.

K. H., a lawyer, had been ill for two weeks. At first he suffered from inflammation of the larynx, which changed in a few days to a most severe pain in the right ear. The application of various household remedies afforded the sufferer little or no relief. At last a copious putrid discharge appeared, which eased the pain greatly, and finally caused its disappearance. Examination showed the ear-passage to be filled with a thin pus. After carefully removing this, Purjesz found the walls of the passage swollen and the ear-drum perforated. The treatment consisted of the use of a gargle and insufflation of iodol. In eight days the discharge had completely disappeared.

Another case was that of a shoemaker, aged

20, rather delicately built, and having a weak appearance. He stated that from his early childhood he had been sickly, and had all manner of diseases, the nature of which, however, he himself was ignorant. From his mother he had heard that from his sixth to his eighth year he had suffered greatly from his ears. His present illness dated four years back, at which time his right ear had begun to discharge. At the beginning of the disease he had experienced neither pain nor fever. Since then the otorrhœa had continued without intermission, the quantity of the discharge fluctuating only slightly. After the removal of the pus an erosion of the external ear-passage was observed. There was a hardening on the upper quadrant of the tympanum and a perforation in the lower. Iodol was used, and the discharge at once began to decrease, and disappeared entirely in eighteen days. The erosions of the ear-passage healed even sooner.

The author says, in conclusion, that in spite of the moderately irritative properties of iodol, it occasions no pain, and is usually well endured by the patients. In otitis media, and especially at the beginning of the disease, it will usually result in recovery in four or five days. Chronic cases also succumb to its effects in a proportionately short time.—*Orvosi Hetilap.*, 1887, 39; *Medicinisch-Chirurgische Rundschau*, November, 1887.

THE TREATMENT OF HYPERTROPHY OF THE PROSTATE.

It is well known that about thirty per cent. of all men above fifty-five years of age are suffering from enlargement of the prostate, but nothing like thirty per cent. of men of this age ever apply to a surgeon for assistance. It is true that many suffer more or less from symptoms which the surgeon would know pointed to prostatic hypertrophy, but these symptoms are not sufficiently severe to prompt the sufferer from them to seek for surgical relief. We must, then, look for some reason which will explain the difference between the two classes of cases, both suffering from prostatic hypertrophy, the one with and the other without symptoms. That this difference does not depend on mere size is a certain fact.

Mr. A. F. McGill, in a lecture delivered in the Leeds Post-Graduate Course (*Lancet*, February 4, 1888), pointed out that there are three forms of enlarged prostate that give rise to characteristic symptoms. These three forms have one common characteristic, they all protrude into the bladder-cavity,—a matter of great importance, since it indicates that in radical operations the prostate must be attacked from within the bladder, and not from the outside, by perineal incision. The varieties consist—1. Of a uniform circular projection surrounding internally the orifice of the urethra, and, according to Mr. McGill, by far the commonest variety, although not described in many modern works on the subject. 2. A sessile enlargement of the middle lobe, situated partly in the posterior half of the prostatic urethra and partly in the position of the uvula vesicæ. It is usually small in size. 3. A pedunculated enlargement of the middle lobe. The outgrowth springs from the prostate immediately behind the urethral orifice. It varies much in size, and the peduncle by which it is attached varies also. Indeed, no distinct line can be drawn between this variety and the preceding one, as the two forms gradually merge into one another.

The mechanism by which the symptoms in these different varieties of enlarged prostate are produced is different. In enlargement of the middle lobe it is evident that the sessile variety acts mechanically by blocking up the posterior half of the prostatic urethra, as well as the urethra orifice, while the pedunculated variety forms a valve, which will be washed forward with the stream of urine at every attempt to micturate, and by blocking up the opening prevent to a greater or less extent the passage of urine into the urethral canal. When the obstruction is due to the formation of a uniform circular growth, projecting into the bladder and surrounding the urethra at all sides, when urination is attempted the bladder-walls contract, and its fluid contents are forced on to the outer surface of the projecting collar, the urethral orifice is thus closed, no urine escapes, and the more forcibly the bladder contracts the less the likelihood of voiding urine. In such cases the patient soon learns that violent efforts prevent micturition, and being unable to relieve himself, soon ceases his efforts; the pressure on the valve is immediately arrested, the urethra is opened, and the urine flows away in a feeble stream. If, again, he attempt to accelerate the flow again, it is suddenly arrested, so that there is always a chance of an incomplete evacuation of the bladder. As a consequence this residual urine greatly increases in amount, the wall of the bladder

becomes thickened, and this increases instead of diminishes the difficulties attending the act of micturition. At the same time some slight cause may induce cystitis, and, causing tumefaction of the urethral orifice, give rise to an acute attack of retention. In any case as time progresses the muscular fibres of the bladder become separated from one another and greatly wasted, this condition being marked by the involuntary passage of urine, or, as it is better termed, overflow. This symptom at first only occurs during sleep; but, as the atony increases, the expulsive power is almost lost, and a constant dribbling is the result. The orthodox treatment of enlarged prostate consists in teaching the patient to pass a soft catheter for himself once or twice daily. When this treatment is successful nothing more is required.

Many patients live for years, and, beyond the slight annoyance of the daily catheterism, have no further discomfort. But, unfortunately, this is not always so. The treatment not unfrequently breaks down. From some cause or other—perhaps from want of care in cleaning the catheter, and perhaps from some hidden cause which we are unable to ascertain—the urine becomes thick and offensive, intense desire to empty the bladder and inability to do so necessitate a more frequent catheterism, till rest is constantly disturbed and death is rendered imminent. In another class of patients the treatment cannot even be adopted. The patient, often belonging to the working class, has, from carelessness, procrastination, or inability to face the necessary expense, delayed seeking for surgical aid till his symptoms become urgent. He has retention of urine, is suffering from extreme pain, and must needs seek relief. The surgeon relieves him by passing a catheter, and, when the acute symptoms have subsided, attempts to teach him to pass one for himself. But he fails in this endeavor. Whether it be from innate clumsiness, natural timidity, or from the inherent difficulty of the case, the patient is unable to introduce the instrument, and treatment by self-catheterism cannot be adopted. It is under these circumstances that the author advocates the trial of a new operation which he recently described in a paper read before the Clinical Society under the name of "Suprapubic Prostatectomy."

The operation consists of two parts: (1) The opening and drainage of the bladder; and (2) the removal of the prostatic valve which prevents the egress of urine. By opening and draining the bladder, inflammation of that organ is immediately relieved; urine, if putrid and offensive, becomes in a few hours sweet and acid in reaction, and unless the kidneys are diseased, and in some cases even if this is the case, a speedy convalescence takes place. The only question to discuss in relation to this procedure is whether perineal or supra-pubic drainage is the more effectual. The author's experience leads him to think that the latter is the preferable method, and that drainage is more complete when through the soft yielding tissues above than through the hard fibrous tissues below the pubic arch. The high incision has, moreover, this advantage,—it enables a more thorough examination of the interior of the bladder to be made and the second step of the operation to be proceeded with. It is absolutely impracticable to remove the collar-like valve, which has been already described, through a perineal wound.

The operation is performed as follows: A full-sized silver catheter, curved according to the nature of the case, is passed into the bladder, its contained urine is withdrawn, and its cavity washed out with a warm saturated solution of boracic acid till this is returned clear and unchanged. In this way it is insured that the wound to be made in the abdominal wall shall not be contaminated by septic urine. A pyriform rubber bag is now introduced into the rectum and filled with fourteen ounces of warm water. Boracic lotion is next injected through the catheter till the bladder can be distinguished as a hard oval swelling, extending upwards towards the umbilicus. The quantity of fluid injected varies with each case, from eight to fourteen ounces being the usual quantity. The catheter is retained in the bladder, the fluid being prevented from escaping by forceps applied to compress the rubber tubing attached to it. The pubes having been shaved and the skin on the abdomen properly cleansed, an incision is made, three inches in length, extending upwards from the pubes in the middle line of the body. The linea alba is divided for the same distance. Without further dissection, by scraping with the handle of the scalpel, the bladder is exposed, and an assistant, by depressing the catheter, makes it project into the wound. A tenaculum with a large curve is passed transversely into the bladder, touching as it goes the point of the catheter. A longitudinal incision is made from above downwards in the bladder-wall, and the escape of its fluid contents is prevented by plugging the opening with the left forefinger.

This being done, the bladder is seized with nibbed forceps, one applied on each side of the incision, the catheter is withdrawn from the urethra and the bag from the rectum, and the first part of the operation is complete. It is important to remember that it is not wise to cut down on the point of the catheter until the bladder has been fixed in position by the tenaculum. If this be done, the point of the catheter protrudes from the wound, the fluid escapes from the bladder, while the viscus itself sinks deep in the pelvis, from which it is only dragged with considerable difficulty. We now examine the interior of the bladder and its neck to ascertain the exact nature of the prostatic enlargement. It is possible that we may find a condition which does not permit further operative interference. The author's experience is not sufficiently large to enable him to say whether this will be often the case or not. His belief is that it will be extremely rare. If we are unable to do anything further, we must content ourselves with temporary or permanent drainage. We shall, however, in a large majority of cases find one of the three forms that have been already described, each of which is removable. A pedunculated middle lobe can obviously be removed with ease, its pedicle being divided with curved scissors. A sessile middle lobe can be removed in the same way, helping the scissors by tearing with forceps. The collar enlargement is removed with greater difficulty. It is advisable to divide it longitudinally by inserting one blade of the scissors into the urethral opening and dividing the portion above, and then passing the other blade into the same opening and dividing the portion below. We now have that part of the gland which projects into the bladder divided into two lateral halves; these can be removed separately by scissors curved on the flat, or enucleated with the tip of the forefinger. Care must be taken not to leave any portion of the projecting valve untouched. When the operation is complete, whichever form of growth has been removed, it is advisable to see that the urethra is patent, and to pass the forefinger as far as the first joint into its canal. The hemorrhage which occurs is not excessive; this is accounted for by the fact that the prostate is not a very vascular organ; the so-called prostatic hemorrhage which occurs occasionally in operations on the perineum being derived from the prostatic plexus of veins, which cannot be wounded in the operation now being described. Such bleeding as occurs is speedily arrested by injecting a hot antiseptic solution. When this has been done, a large rubber tube is passed into the bladder and left out of the lower angle of the wound in the abdominal wall; this is partially closed by a point or two of suture, and a large pad of salicylic absorbent cotton-wool is applied as a dressing. The pad is renewed as often as it becomes saturated every three or four hours. The tube is removed at the end of forty-eight hours.

Mr. McGill's experience of this operation is limited to five cases, in each of which before operation constant catheterism was required. In two the urine was purulent, alkaline, and fetid, while in one symptoms of uræmia and surgical kidney were present. Four of these cases made quick and satisfactory recovery, while the other, a very recent case, is still under treatment. The successful cases all left the hospital in restored health, passing urine without the aid of a catheter in a natural manner. Two of the cases were operated on eight months ago, and have not in any way deteriorated, no stricture resulting. Of course, if the bladder be atrophied and the kidneys diseased, only temporary relief may be expected; but if, on the other hand, the bladder and kidneys are in a healthy condition, we may hope that this operation will in many cases lead to a radical cure.

AN ANTIDOTE FOR IODOFORM.

The *Rép. de Pharm.* states that Dr. Behring recently gave a twenty per cent. solution of bicarbonate of potassium in a case of severe iodoform-poisoning. The best results followed its use, it seeming to act as a direct antidote to iodoform.

Fortunately, cases of iodoform-poisoning are rare, so much so, indeed, that they are usually termed "idiosyncrasies." Although we hope that bicarbonate of potassium may prove to be efficacious in such cases, we will also hope that its antidotal properties may but rarely be called into requisition.

HYPODERMIC USE OF SALT AND WATER.

An interesting article appeared only lately in the *Przeglad Lekarski*, xxvi. 33, 35, 1887, by Dr. Rosenbuch, relating to the value of hypodermic injections of salt and water. Cantani's work concerning its value in cases of cholera suggested its use to the author, who tried it in cases of long diarrhœa, vomiting, and hemorrhages, and observed both a

nutritive and a stimulative action upon the cardiac muscles. He used a six per cent. solution, of which he injected from 5 to 20 grammes at one place. Dr. Rosenbuch never observed any inflammation or the formation of an abscess to follow its use. After twenty or thirty grammes had been injected, the pulse would become slower and fuller in three to five minutes. This improvement would last for several hours.

The following symptoms the author considers to indicate the above treatment:

1. Sudden collapse.
2. Heart-failure in acute diseases.
3. Gastro-enteritis acutissima.
4. Hemorrhages of the lungs, stomach, or bowels.
5. Cachexia during chronic ailments. 5 grammes (1 gramme=16 minims) of the solution may be injected daily in the latter.—*Schmidt's Jahrbücher der Gesammten Medicin*, Jahrgang 1887, No. 11.

CREOLIN IN CYSTITIS.

In a very persistent case of cystitis occurring in a middle-aged woman where the pain was so constant that the patient was generally obliged to keep her bed, and where the urine was offensive, brownish, and thick, depositing a third of its volume of pus, blood, and phosphates, after a large number of different kinds of treatment had been employed by various medical men without much result, the best application appearing to be injections of corrosive sublimate in very weak solutions, Dr. Jefsner, of Stolp, washed out the bladder with a one-half per cent. solution of creolin. This caused a burning sensation for a few minutes, after which it passed off. The next day the patient felt and looked quite a different woman, the pain in the bladder had been less than for a long period previously, and the urine when drawn with the catheter was scarcely offensive at all, and appeared quite clear, depositing after a time only a small quantity of phosphate without any admixture of pus- or blood-corpuscles. The washing out of the bladder was repeated daily, and by this means the improvement was maintained. It would appear, therefore, that in creolin we have a deodorizer and a hæmostatic, as well as a means of improving the character of the secretion from the surface of mucous membranes.—*Lancet*, January 14, 1888.

PENGAWAR DJAMBI.

Mr. B. Reber, of *Der Fortschrift*, writes in No. 21 (November 5, 1887) of that journal as follows: Pengawar Djambi, or Paku-kidang (Paleæ, or Pili Cibotii), is an excellent hæmostatic, which—for some time almost neglected—has recently come more and more into use in Germany, Holland, France, Switzerland, and Russia. Several writers have lately written on this subject, the most important of whom are Dr. F. A. Flückinger, *Pharmacognosie;* Dr. H. Hager, *Handbuch der Pharmaceutischen Praxis;* and Dr. F. Prollius, in the *Pharmaceutische Centralhalle*, 1884, p. 170.

The Pengawar Djambi consists of the silky, glossy, yellow or brown hairs on the stems of several kinds of tropical ferns. These, differing from ours,—the stems of which generally are only covered by dry scales,—produce hairs, often in such abundance as to cover completely the base of the petioles of the fronds, the stem, and even the roots. The drug in commerce is a mixture of the hairs of a great number of such tropical ferns, the principal of which will be mentioned in the course of this paper.

The genuine Pengawar Djambi, which comes from Djambi in Sumatra, is gathered from several species of the genus Cibotium,—viz., *C. Barometz* Kunze, *C. glaucescens* Kze., *C. Cumingii* Hasskarl, *C. Assamicum* Hassk., and *C. Djambiacum* Hassk. These, however, are believed by some botanists to be merely varieties of the same species, and are found not only in Sumatra, but also in Borneo, in the Philippines, in Cochin China, in China, and in the interior of Asia. The stems of these ferns barely reach the height of one foot, while the fronds attain more than six feet. Stem and roots are densely covered with tufts of hair from three-fourths of an inch to one inch and a quarter in length, and of brilliant golden-yellow color. These hairs are transversely divided into a great number of segments, and flattened between the joints.

At Java there are other species of tree-ferns the stems of which attain a height of nine feet, and at the base are surrounded by pengawar of a more brownish tint than the Djambi. The most important of these beautiful tree-ferns are *Alsophila lurida* Bl., *Chnoophora tomentosa* Bl., and *Balantium chrysotrichum* Hassk. They are called *Paku* by the natives of Java, and the hairs *Paku-kidang*, because the coppices of these tree-ferns give shelter to great numbers of goats, the Malay name of which is kidang. The hairs of all

these different kinds of ferns are very similar in appearance, and possess the same medicinal properties, which, however, are also met with in the hairs of great many other tropical ferns,—*e.g.*, *Cibotium Schiedeanum* Schlechtend. in Mexico, *Lophosoria affinis* Presl. in South America, and of some other kinds in Central America. Besides these, the *Cibotium princeps*, *Cyanthea insignis*, *Alsophila australis*, *A. Drægeri*, *A. lucida*, and *A. tomentosa* likewise produced pengawar.

The Dutch, since 1837, import into Europe, instead of the genuine Pengawar Djambi, the Paku-kidang, known by the name of Dutch pengawar, which is a mixture of the hairs of the most easily accessible ferns, in form of compressed packets of varying size. The hairs are about two inches long, and of all shades between bright yellow to dark brown. They represent, under the microscope, tubes of twenty to thirty micro-millimetres in diameter, of very delicate walls, and transversely divided by an internal adventitious layer into numerous joints of forty to eighty micro-millimetres in length, which, however, are not externally marked by intumescences or nodes. On drying, the hairs, which contain barely anything else but air and a minute quantity of essential oil, become flattened and form bands.

Sometimes several of these hairs are soldered together, and thus resemble the scales of our indigenous ferns. The hairs of the Paku-kidang lose, at a temperature of 100° C. (212° Fahr.), ten per cent. of the oil. They float at first on the water, which they very soon absorb, and then sink to the bottom. They so rapidly absorb the water of the blood that coagulation takes place and closure of the divided vessels. Very little of the pengawar suffices to arrest even considerable hemorrhage.

Their chemical constituents are small quantities of tannin, wax, and an essential oil, which in the *bain marie* disengages a very pleasant scent, and, besides these, products of decomposition, cellulose, and, according to Vogel, starch-cells. Before use, it will be advisable slightly to crush the pengawar in order to facilitate its action by capillarity and endosmosis, and to bring the greatest number possible of these capillary tubes in contact with the bleeding wound. This will be the more necessary, as these tubes will not absorb by their walls, but only by their openings, and because those of several species (viz., *Cyanthea insignis*, *Alsophila australis*, etc.) are invested with numerous lateral spicules, the points of which may be felt by rubbing the hairs between the fingers, and which would prevent the perfect adaptation to the bleeding surface.

Pengawar was already known as a hæmostatic in the Middle Ages. It was brought from Asia still attached to the stems of the plant, and was known by the name of *Frutex tartareus*. Sometimes the stems of these ferns were arranged by leaving attached a portion of four to five petioles in such manner as to represent the shape of a sheep, four petioles forming the legs and one the tail, or, if the fifth was missing, a piece of bamboo supplying the latter. The stem itself, with its long hairs, imitated the body of the animal, which was sold under the name of *Agnus Scythicus*, and the mysterious appearance of which gave rise to many fables as to its origin, and served for numerous superstitious uses. In India, where the pengawar is most extensively used as a hæmostatic, its form of a sheep is still preserved, and is originally prepared in the province of Djambi at the eastern coast of Sumatra, whencefrom Arab merchants bring it into the markets of Java, where it is called Pengawar Djambi, which means medicament of Djambi.

Pengawar is often substituted or adulterated by a kind of vegetable hair obtained from an Indian Malvacea, the silk cotton-tree, the *Eriodendron anfractuosum* De Candolle, or *Bombax pentandrum* L. The hair of this tree, however, which resembles cotton-wool, differs from those of the several kinds of ferns by having only two or three transverse partitions forming external nodes, whereas the pengawar hair possesses a great many transverse divisions, or joints, without external nodes. Moreover, although both resembling in color, that of the cotton-tree is much brighter.

Dr. Junker (*London Med. Record*, December 15, 1885) had during the last Franco-German war frequently occasion of testing the hæmostatic properties of the Pengawar Djambi. He employed it in many cases of capillary hemorrhage, and of bleeding from small vessels, which were either cut, torn, or laid open by sloughing, in some instances even on very extensive surfaces, and for plugging. Generally only a thin layer of it was required, and the bleeding was sometimes arrested even before the superior strata (or, in plugs, the more central portions) had become imbibed with blood. The pengawar, if smoothly adapted, can be easily removed without causing irritation, as the hairs will then not be-

come matted and will not clog and stick to the wound. Having always employed carbol-spray, produced by a Siegl's inhaler, when dressing wounds, although at that time the antiseptic treatment had not yet been generally adopted and regular spray apparatus not invented, he never noticed any signs of infection from the use of pengawar, as might be suspected from the above statement that among its constituents the products of decomposition had also been found by chemical analysis.

ANTIPYRIN AND CARBOLIC ACID.

Solutions of antipyrin being now not unfrequently required for subcutaneous injection, the addition of carbolic acid has been suggested as a means of preventing in them fungoid growths. The observation that a turbidity in the solution was caused sometimes upon making such an addition led Dr. Vulpius to investigate the conditions of the relative solubility of these two compounds (*Apot.-Zeit.*, January 21, 1888, p. 30). At first the turbidity was looked upon as an instance of the smaller solubility of one of two substances in a solution of the other as compared with its solubility in pure water, but eventually it appeared to be due to the formation of a relatively insoluble compound of carbolic acid and antipyrin. As the result of a number of experiments made to ascertain the proportions in which the two compounds could be mixed together in water without turbidity occurring, it was found that if a solution contained much less than one per cent. of carbolic acid or 0.5 per cent. of antipyrin no separation took place upon the addition of a concentrated solution of the other body. As the molecular weight of antipyrin (188) is exactly double that of carbolic acid (94), this would seem to indicate the formation of a compound containing one equivalent of antipyrin and two equivalents of carbolic acid, soluble in water to the extent of one to two per cent. The solubility, however, greatly increases with the temperature, and a solution saturated and clear at 100° C. becomes turbid at 90° C. The combination would appear to be a very loose one, since if the only deposit that collects at the bottom of a supersaturated solution be exposed to a temperature of 100° C. it loses weight and eventually crystallizes, presenting then the characters of antipyrin. It follows from the foregoing that carbolic acid cannot be added to hypodermic solutions of antipyrin in the quantity required to effect sterilization. Nevertheless, antipyrin is freely soluble in melted absolute carbolic acid, and a mixture of two parts by weight of antipyrin with one part by weight of carbolic acid forms a syrupy liquid that behaves similarly to that which separates from supersaturated aqueous solutions of mixtures of the two compounds.—*Pharmaceut. Journ. and Trans.*, January 28, 1888.

SUCCESSFUL EXCISION OF A TUMOR OF THE SPINAL CORD.

Surgery is a science, or, perhaps, we should say a fine art, which will tolerate no limits to its domain. It has of late taken up the invasion of the brain in earnest; it has just made its first successful dash at a tumor in the spinal cord. Last Tuesday evening, before the meeting of the Medical and Chirurgical Society, a private patient of Dr. Gowers and Mr. Victor Horsley very generously allowed the Fellows and visitors of that society the opportunity of seeing all that had been done for the improvement of his condition. He had spent about three years in severe pain, which was most intense just below and inside the angle of the left scapula, and was accompanied by absolute loss of motion and sensation of the body and limbs below that level. The upper border of the anæsthesia was distinctly in the region of the fifth intercostal nerve on the left side, on the right it was less accurately defined, but did not extend higher. All the symptoms agreed with those of tumors of the spinal cord, and the intense pain afforded ample justification for making an attempt to excise the tumor. Mr. Victor Horsley accordingly removed the spines and parts of the laminæ of the fifth and fourth dorsal vertebræ; but not until the third vertebra had been similarly treated did the tumor come into sight. It was a small oval myxoma compressing and making a deep impression on the left side of the spinal cord below the third vertebra. It was easily shelled out, and under careful antiseptic treatment the temperature did not rise more than 1° F. The wound healed rapidly, except at the uppermost point, where a drain had been left in by which a little cerebro-spinal fluid flowed away very slowly. For three or four weeks the former acute pain did not lessen, and even at times seemed more agonizing; but after that it gradually and intermittently decreased, and now, after seven months, is entirely gone;

the sensation and motion of the body and legs are almost completely restored. This is, we believe, the first time that such an operation has been attempted, and we must most heartily congratulate both the patient and his advisers on the triumphant character of its success. However far and however quickly surgery may advance, it will long be a memorable day when it gained its first victory on so new a field and over so formidable an enemy. —*Brit. Med. Journ.*, January 28, 1888.

IODINE IN ASCITES.

Dr. Rivadeneyra, writing in *La Correspondencia Médica* on ascites due not to lesions of the heart, kidneys, or liver, but to the general condition of malarial poisoning, speaks highly of the success of iodine applications. He applies the tincture to the surface of the abdomen in strips or fringes, leaving a breadth of clear skin between each. The untouched parts are similarly painted when the iodine has caused the skin to begin to peel off. In cases where the ascites is very considerable, paracentesis is first performed, and the iodine applications commenced a few hours afterwards.—*Lancet*, January 28, 1888.

HYDROGEN PEROXIDE AS A LOCAL APPLICATION IN DIPHTHERIA.

However authorities may differ in regard to the essential nature of diphtheria, physicians appreciate the value in many of their cases of efficient local treatment. That certain cases of diphtheria recover without this is no better argument against the topical use of a remedy than can be brought against antisepsis elsewhere. There is no better reason for allowing putrid, sloughing material to remain in the throat than in the uterus. Nevertheless, it is generally admitted that of local measures antiseptics are to be preferred to escharotics. Consequently, the best application in such affection must be one which is not only efficient and not hurtful to the sound tissues but also painless in its application. Such a substance Dr. M. P. Hatfield (*Archives of Pediatrics*, February, 1888) believes can be found in a well-prepared solution of hydrogen peroxide in water or glycerin.

Hydrogen peroxide (H_2O_2) in its gaseous state cannot be conveniently prepared at the bedside; nor would it then be of as easy application as its aqueous or glycerin solutions. The first of these, commercial hydrogen dioxide, contains 2.88 volumes of the gas, and, if properly prepared, is a perfectly clear, colorless fluid, specific gravity 1010 to 1011, without odor and without any taste, but leaves a faint sensation similar to that of a solution of carbonic acid upon the tongue. Such a solution is neither escharotic, caustic, nor astringent in its action upon either healthy or diseased tissues; but, nevertheless, it has been proven one of the most efficient of known antiseptics, for Miguel places it third (.05 gramme to the litre being sufficient to prevent the growth of bacterial life in beef solutions) in his list of sporicides.

In short, we have in a solution of hydrogen peroxide a bland, harmless, but nevertheless an exceedingly efficient antiseptic,—far more so than either carbolic acid, alcohol, salicylic or boracic acids. It neither stains, corrodes, nor injures sound tissues, and would seem to be on theoretical grounds the ideal antiseptic for local use. Dentists and surgeons have found it most useful in old fistulæ and small pus-cavities, and the writer believes it of equal value as a local application to diphtheritic membranes. It is equivalent to placing them in an atmosphere of nascent oxygen, without other after-affects from the solution than those which follow the application of pure water, for the efficiency of hydrogen dioxide is due to its setting free oxygen when brought in contact with dead matter, which is thus oxidized and its pus-cells and bacteria, if it contains any, destroyed, at the same time H_2O_2 being changed to H_2O, or ordinary water.

The author states that during the past few weeks eighteen cases of diphtheria, of varying intensity from very grave to light, have been treated with hydrogen peroxide, and all recovered. The number of these cases is as yet too small to draw general conclusions, but they would indicate that in hydrogen peroxide we have an agent that is valuable as a local disinfectant when efficiently applied either by means of a swab or in the form of a spray (two ounces diluted with seven times its bulk of water). Diphtheritic throats treated thus every two hours do not become, according to the author, even in the worst of the eighteen cases under observation, putrid and offensive, as they inevitably do if left to their own devices. Hydrogen peroxide does not act as a solvent upon the diphtheritic membranes, but rather as its disinfectant and antidote, nor does it prevent the formation, but neutralizes the poison of the diphtheritic exudate, and thus anticipates many of the se-

quelæ of this disease. It certainly would appear worthy of more extended trial in malignant diphtheria.

SCOPOLEINE AND ROTOINE.

Up to the present time but little has been known of those poisonous alkaloids which are prepared from the root of the *Scopolia japonica* (Maximowicz).

The roots of this plant, which are called *roto* in Japan, were brought to the European market under the name of *Radix belladonnæ japonicæ*, and, according to the analysis of an unknown chemist in Tokio, were supposed to contain solanine. A. Langgaard found two bodies in the root; one, which enlarged the pupil, he called rotoine, and to the other, which seemed closely connected with atropine, daturine, or hyoscyamine, and which also seemed to be a powerful mydriatic, he gave the name of scopoleine. The presence of scopoleine in the root was also confirmed by Dr. J. E. Eikmann, of Tokio, who in addition also found it to contain a glucoside, to which he gave the name of scopolin. Under the influence of great heat and diluted sulphuric acid this split up into glucose and a crystalline volatile body called scopoletin.

A year later scopoleine appeared in the price-list of F. Merck, of Darmstadt. This preparation was of a syrupy nature. Professor E. Schmidt had found a few years previous pure atropine in this preparation, and had then expressed his opinion that the substance very probably also contained hyoscyamine.

In the meeting of Natural Scientists in Wiesbaden this year, Dr. Schmidt, of Marburg, reported that the root of the *Scopolia japonica* contained no new alkaloid which had the property of enlarging the pupil, but states that he has found in the root, and also in the scopoleine of Merck and Eikmann, atropine, hyoscine, and hyoscyamine.

The quantity of these three alkaloids in the root is very variable, and this Professor Schmidt believes to be due to the age of the root.

Dr. Schmidt also found another substance in the root (scopoletin), which Eikmann had recognized as methylæsculetin. This body was identical with atropa belladonna.

Also rotoine was found to exist merely in name, as it proved to be a combination of alkali metals with saponic acids which were rich in carbon.—*Der Pharmaceut.*, January 1, 1888.

BENZOIC SULPHIDE OF SODIUM AS AN ANTISEPTIC.

E. Heckel, says the *Comptes Rendus Bullet. Commerc.*, prepares benzoic sulphide of sodium, or natriumsulfibenzoat, as it is called in German, by dissolving a large quantity of benzoic acid in a concentrated solution of sulphide of sodium.

This preparation is perfectly harmless even when given in large doses. It is easily soluble in water, and contains the antiseptic properties of its two principal constituents.

According to the experiences of Heckel and other surgeons, among whom we may mention Professor Fontan, of Toulon, it is a most valuable dressing for wounds, when used as a wash or upon a bandage. Four to five grammes (30 to 45 grains) of the preparation are used to every quart of water. Its antiseptic properties are very active and promote healing. Heckel considers it to be equal to carbolic acid, and superior both to sublimate and iodoform, as it is not poisonous, whereas the former is, and because it is free from any disagreeable effects like those of the latter.

INCOMPATABILITY OF IODOFORM AND CALOMEL.

Some time ago it was noticed by Bendiner that a mixture of iodoform and calomel underwent certain chemical changes soon after its preparation. Dr. A. Drescher, says the *Journal de Pharmacologie*, was struck by this statement, and immediately set about to find out the cause of such a chemical action.

The results of his researches are as follows: A mixture of equal parts of iodoform and calomel, when exposed to the atmosphere and light, would, in about an hour's time, be in a state of advanced decomposition. If the mixture was heated slightly in a test-tube, an odor of chloroform soon became apparent, and the formation of a sublimate was observed in the upper portion of the tube. The reaction was as follows: $2CHIO_3 + 3Hg_2Cl_2 = 2CHCl_3 + Hg_2IO_2$. If the test-tube was subjected to a still greater heat, the odor of chloroform was not alone discernible, but also that of iodide of mercury; also a greenish-yellow color was observable, which soon changed into yellow, and then into orange-red, this showing the presence of mercuric iodine.

The author concludes that—

1. The decomposition of a mixture of iodoform and calomel is principally due to

the influence of light or the application of heat.

2. The formation of mercuric iodine is not due to the direct action of the iodoform and calomel upon each other, but is caused by a secondary reaction.

HYPODERMIC VALUE OF ANTIPYRIN.

Recently the hypodermic use of antipyrin has been attracting considerable attention in the profession in Europe. Dr. R. Hirsch, says the *Medicinische Chirurgische Rundschau* of December, 1887, writes of the wonderful success with which he has treated nervous articular and muscular pains with antipyrin injections; also in one case of gastric crises and one of bronchial asthma. In all these cases relief followed the first injection, and, after the second injection, the pain disappeared entirely.

The formula which Dr. Hirsch used was composed of equal parts of antipyrin and water, and of this solution he injected from a quarter to the entire contents of a Pravaz hypodermic syringe into the subcutaneous tissue near the painful parts. The syringe should always be thoroughly cleaned and disinfected with a five per cent. solution of carbolic acid.

The drug was used hypodermically with great success in a case of severe neuralgia of the trigeminus, and in one of articular rheumatism.

Dr. Veninger has also used antipyrin in this way with astonishingly good results. He especially refers to a case of severe chronic lumbago, which was immediately relieved by the drug.

In no case were the injections followed by any disagreeable symptoms.

BERBEMINE AND OXYACANTHINE.

Berberine is an alkaloid found in the roots of the *Berberis vulgaris*. Dr. O. Hesse has recently been experimenting with the drug, and has found that the roots further contain at least four other alkaloids, among which are berbemine and oxyacanthine.

Berbemine was first isolated by Hesse, and by him it has been assigned the formula of $C_{18}H_{19}AZO_3 + 2H_2O$. This alkaloid comes in the form of small leaf-like crystals, which are obtained from the alcoholic solution by evaporation. It is soluble in ether and melts at 156° C. If ammonia or caustic soda be added to the acid solution it will cause a flaky precipitation, which soon becomes crystalline.

Very little can be said either of the physiological or therapeutical action of berbemine, as it has not yet been experimented with to any extent.

Oxyacanthine has been known since 1836. Polex was the first who prepared it from the berber-root. It is an alkaloid, and has the formula of $C_{18}H_{19}AZO_3$. It differs only from berbemine in the absence of the two molecules of water.

With acids, oxyacanthine forms crystalline salts, which are colorless, and have a bitter taste. Nitrate of silver causes a white precipitate in solutions of the alkaloid.—*Bulletin de la Société Royale de Pharmacie*, Brussels, December, 1887.

PILOCARPINE IN RHEUMATIC TETANUS.

Dr. Brunauer, in the *Presse et le Courrier Méd.*, tells of the case of a woman, aged 40, who, when he was called in, had for several days been suffering from trismus. The muscles of the limbs and trunk were partially contracted. During eight hours the patient had six tetanic convulsions. For the next five days Dr. Brunauer tried in vain to check these convulsions by hypodermic injections of morphine, and the use of quinine, iodine, and salicylic acid. After this the patient was given hypodermic injections of 2 centigrammes (about ⅓ grain) of pilocarpine daily. Every night a dose of chloral hydrate was also given. Every injection of pilocarpine was followed by profuse perspiration. The patient gradually improved, and on the ninth day after the treatment had been commenced the recovery was complete.

SALICYLIC COLLODIUM.

The following formula is recommended by the *Rundschau*, No. 973, 1887, as a most efficacious application for corns, warts, or any hardened flesh:

℞ Acid. salicylici, 10 parts;
Acid. lactici, 10 parts;
Collodii, 80 parts. M.
S.—Salicylic collodium.

Reviews.

TRANSACTIONS OF THE NEW YORK STATE MEDICAL ASSOCIATION FOR THE YEAR 1886. Vol. III. Edited for the Association by Alfred Ludlow Carroll, M.D.

Concord, N. H.: Republican Press Association, 1887.

This volume contains a very excellent steel engraving of the late Dr. Austin Flint, and many very excellent papers. Of course no transaction of a New York State Medical Society would be complete without "some observations on the use of the mineral waters of Saratoga." The present observations are from the pen of Dr. R. C. McEwen, of Saratoga County, and coupled with the fact that the daily press has recently announced that the springs have ceased flowing, may be considered in the light of an obituary notice.

Dr. Alfred Ludlow Carroll has a humorous paper on "Recovery *versus* Cure," which runs "amuck" at proprietary medicines, germ infection, and other novelties, and goes so far that the writer is forced to say, "I would not be misunderstood as decrying all medicinal treatment."

In a paper on "Erysipelas," Dr. Fredk. Hyde sums up our knowledge on the subject in a few concise sentences, among which we read, "That there are no tissues nor textures in the body that may not be invaded by erysipelas," and "that it has too often occurred in the mild cutaneous form of erysipelas that a local application of nitrate of silver, iodine, and other external appliances popular with some surgeons converted the case into a cellulitis." A very good paper by Dr. Judson B. Andrews, of Erie County, tells us something about "Morphine and Cocaine Habit;" and Dr. Edward R. Squibb gives his personal experience in eight months of foreign travel of "Medicine and Pharmacy Abroad." From a perusal of his paper we get the idea that Europe is but poorly supplied with doctors and druggists, so far as numbers go, but that in quality and influence they surpass us.

The same writer gives us a paper on "Relations of Physicians to their Medical Supplies," which deals severely with the growing evil of the dependence by many physicians on proprietary medicines and ready-made pills, and the habit of relying for our knowledge of materia medica and therapeutics "upon the travelling salesmen and their pamphlets and lists." Written by a practical and experienced pharmacist, to bring practitioners to a better mind, and lead them to do independent thinking and prescribing on their own account, the paper is timely and salutary.

The "Discussion on Shot-Wounds of the Intestine" is of great surgical interest. Dr. Simon Tueber Clarke discusses the question of expert medical testimony in the address on "Medical Jurisprudence." Dr. Chas. W. Brown writes on "Dislocations of the Ankle," proposing a new method of treatment; and Dr. H. C. Van Zandt takes up again the subject of "Commercial Prescriptions," evidently a sore one, especially with the rural practitioner. A great many isolated cases are reported, and somebody enters "A Plea for Sims's Speculum." The discussion on "Pulmonary Tuberculosis" is interesting, if not novel.

"A Remarkable Case of Obscure Toxæmia" will perhaps set the reader thinking, but without immediate results.

Dr. Wm. T. Luke's remarks of introduction and the succeeding "Discussion on Eclampsia" is probably the best thing in the book. In this we find able articles by Dr. James Tyson, Dr. Isaac E. Taylor, Dr. T. Gaillard Thomas, Dr. Geo. T. Harris, and Dr. Darwin Colvin, and remarks on an allied topic,—viz., "The Connection, if any, between Insanity and Puerperal Convulsions,"—by Drs. Jas. R. McGregor and G. Alder Blumer. Memoirs of the late Dr. Frank Hastings Hamilton, Dr. Jno. P. Gray, Dr. Isaac Purdy, Dr. Desault Guernsey, and others conclude the volume, which is handsomely bound and printed, and presents a very attractive appearance. E. W. W.

A COMPLETE HANDBOOK OF TREATMENT, ARRANGED AS AN ALPHABETICAL INDEX OF DISEASES TO FACILITATE REFERENCE, AND CONTAINING NEARLY ONE THOUSAND FORMULÆ. By Wm. Aitken, M.D. (Edin.), F.R.S., etc. Edited, with notes and additions, by A. D. Rockwell, A.M., M.D., etc.

New York: E. B. Treat, 771 Broadway, 1887.

Those American readers already infatuated with Aitken's "Practice of Medicine" will hail with delight this epitome. The editor apparently considers that the sun of medicine rises and sets in that volume alone, and that it is useless to look elsewhere for information. To those poor creatures who from the *res angustæ* are unable to bask in Aitken's complete effulgence, he offers this volume as a source of reflected light. It scarcely deserves, however, its designation of "a complete handbook." The world has moved, though his medical luminary has not, and

numberless things have been discovered in the past decade of which Aitken apparently knows nothing. A very hasty glance at these pages will show a marked absence of any mention of numerous tried and successful methods of treatment, to go no further. The reader who relies on him must treat dysentery without small doses of corrosive sublimate, must struggle with the hemorrhage of typhoid fever without ergot or ergotine, must never give mercury in any form in tuberculous disease, and abandon the benefits of iodoform; must ignore the bichloride in puerperal antisepsis; must treat quinsy without salicylate or antirheumatics, and in scrofula know no iodoform. What there is in the book is good, what is wanting is something better; but, at all events, it is not a complete handbook of anything but Aitken's practice, the absence of which from one's library it will completely supply, and as such it can be heartily recommended. E. W. W.

ASEPTIC AND ANTISEPTIC SURGERY. By Arfad G. Gerster, M.D.
New York: D. Appleton & Co., 1888.

With the author of the above work we are in full accord when he writes, "The principle underlying antiseptic surgery has ceased to be the subject of serious controversy." Indeed, we would go still further and say, that now the subject has gone beyond any controversy either pro or con; in fact, it has been decided that asepsis or antisepsis must be employed in surgery by those who desire to obtain the best results with the least danger and suffering to those upon whom they operate. The question of how to obtain the aseptic or antiseptic condition has not yet been decided for all who believe in this method of treating wounds,—that is, in so far as a universal agreement in the method to be adopted; some advocating one system, while others strongly advise an apparently opposite method. We say apparently opposite, since it will be found by investigating that what seems to be so directly contradictory is in truth only another way of reaching the same end, and that the principle involved, as stated by Dr. Gerster, "is based on the correct observation of a common biological process,—namely, that of the decomposition of organic substances." Therefore any method of treatment that prevents decomposition of tissues or opposes septic infection is an aseptic form of treatment; while, on the other hand, the antiseptic method of treatment limits or removes the septic condition of wounds, and is, perhaps, somewhat a preventive of septic infection.

The work of Dr. Gerster is not presented to us as a text-book on surgery, but is intended "to illustrate the incisive practical changes that the adoption of aseptic and antiseptic methods has wrought in surgical therapy." When the object of the author is thus understood, it does away with what seems at first to be a very unsystematic work on surgery, and gives place to a most instructive, thoroughly practical, indeed indispensable, book for the modern surgeon.

Under the heading "Asepsis," Part I., we find the most instructive portion of Dr. Gerster's book. Here are given the rules, which must be faithfully carried out if successful results are to be obtained; and it will be noted that the fundamental principle upon which depends success or failure is cleanliness. To those who practise aseptic surgery—and in our opinion no others should do operative surgery—the section on "Rules of Surgical Cleanliness," given by the author, should not only be read but carefully studied and memorized. To those unaccustomed to the employment of aseptic methods of surgical operations there seems to be much unnecessary detail and useless caution in carrying out the treatment. Thus, "Whenever any one of those engaged at an operation touches a not disinfected object,—hands a chair, opens the window or door, helps the anæsthetizer during a vomiting spell of the patient, scratches his face or wipes his nose,—*it is absolutely necessary* that his hands be *scrubbed and disinfected anew*. Instruments that are accidentally dropped should be left untouched. Raw assistants, and *especially nurses*, male and female, trained or untrained, should be earnestly instructed beforehand, and *constantly watched* afterwards, regarding this all-important discipline." One who has been brought up under the old methods of operating cannot easily understand the reason for such minute care on the part of the operator. Our advice to all such is to read the cases given in the context by Dr. Gerster, and if they do not carry conviction, we prognose a hopeless case and diagnose mental obstinacy. The author, in writing of the necessity for faithfully attending to minute details, and the easy acquirement by practice of overcoming the difficulties, says, "Unremitting attention to, and a severe self-discipline in always carrying out the measures of strict cleanliness known to be necessary to uniform success in the management of wounds,

will gradually become, however irksome in the beginning, a mere matter of accustomed routine. As the mind and senses learn to exercise vigilance without special effort, the surgeon's results will become more and more gratifying."

There is one question, in regard to the method of treatment of wounds, that we, with much hesitation, venture to advise a procedure not mentioned by Dr. Gerster. We have reference to the very important question of drainage. Admitting with him that, "theoretically speaking, a *perfectly* aseptic wound does not require any drainage," and also admitting with him that the "possibility of a however slight and unavoidable contamination should always be kept in view," the necessity for drainage is evident. Our author recommends rubber tubing, and there is no doubt but that it answers the purpose, not, however, so satisfactorily as one would wish; in a word, it does not admit of a complete union of the wound. It is a foreign body, and must, after a certain period, be removed, and therefore an exposure of the wound is necessary. To overcome these objections is to more nearly reach the ideal treatment, and our experience with catgut drainage, properly employed, has convinced us of its advantages over the rubber tubing.

Part II. is entitled "Antisepsis," and treats of suppuration or phlegmon, its causes, development, spread, diagnosis, and treatment. The etiology of suppuration is, we believe, rightly considered by the author due, without exception, to infection from without, and the infecting agents are pyogenic organisms, known as cocci and bacteria. Neither mechanical nor chemical irritation, it is said, are capable of giving rise to suppuration, unless they are accompanied with infectious substances,—the "microbial filth." The conclusions of Dr. Gerster in regard to suppuration are so very positively contrary to the surgical teaching of the recent past, that we quote them in full: "Suppuration is always undesirable and dangerous, and, if possible, should be avoided by all means. Its essence is textural destruction and death, and systemic intoxication. The phrase, 'healing by suppuration,' is an absurdity, is misleading to the student, and should be banished from textbooks. As a matter of fact, healing never takes place while active suppuration lasts; it occurs only after the limitation and termination of suppuration, not by it, *but in spite of it.*

"The expression, 'laudable pus,' as applied to the contents of an abscess during one of its stages of spontaneous limitation or maturing, is also misleading. *Pus is never laudable;* it always is a menace to the health and integrity of the animal organism. Suppuration is a treacherous ally, and its aid should never be invoked by the modern surgeon, or, at least, should be shunned as long as other ways of curing an ailment remain untried."

The treatment of the various forms of suppuration, given by the author, has our endorsement both as to its efficacy and its correct theory. The opinion expressed in regard to the employment of the poultice is, we believe, no exaggeration, but an undoubted truth; it is said, "Certainly a mixture of soured linseed, with ichor and pus, enclosed in a foul rag, is the worst of all abominations that a decaying era of surgery has left behind as its legacy." The experience of most surgeons, we are sure, can testify to the justice of the following: "The cataplasm is resorted to not only to allay the patient's pain and fear, but often serves as a convenient mantle to hide ignorance or indecision."

Part III., "Tuberculosis, its Aseptic and Antiseptic Treatment." This section considers the various forms of tuberculosis in which surgical interference is advisable; it includes lupus, which is believed to be identical with tuberculosis, and is described as cutaneous tuberculosis, tuberculosis of the mucous membrane, lymphatic glands, tendinous sheaths, bones, and joints. The disease, wherever occurring, is said to be a manifestation of one and the same morbid process, —"namely, of cellular decay caused by the deleterious influence of a vegetable parasite, —Koch's tubercle-bacillus." The principle upon which the treatment of this affection is based is an attempt to remove the disease, and is thus stated: "The modern treatment of local tuberculosis is identical with that accepted for the cure of malignant new growths; it consists in a more or less complete removal of the affected tissues or organs by caustics, the knife, or the gouge, under aseptic precautions."

Part IV., "Gonorrhœa, its Antiseptic Treatment." The etiology of this disease, being alone due to a specific organism,—the gonococcus,—is accepted by Dr. Gerster. He writes, "Gonococci are to be found in the secretion of every case of gonorrhœa;" and again, "Secretions that do not contain gonococci are invariably non-infectious if brought upon the urethral mucous membrane." That the former of these propositions may be true we are willing to admit; but the latter state-

ment we do not accept as a fact. Indeed, we have not yet been convinced of the specific nature of gonorrhœa, believing it to be an inflammation arising from pus-contagion. It may be said the urethritis is not gonorrhœic. It has, nevertheless, all its clinical symptoms, even to its contagiousness. That the affection is caused only by a specific organism the author, notwithstanding the above statement, seems inclined to doubt, since we find a page farther on he writes, "The presence of various micro-organisms aside from the gonococcus, in recent and chronic urethral discharges, seems to point to the fact that *most cases of urethritis represent a mixed form of bacterial infection;*" and again, "It seems, then, that pus-generating organisms play an important part in cases of gonorrhœic and non-gonorrhœic urethritis, and that the metastatic processes complicating urethral inflammations are mostly chargeable *to these and not to the presence of gonococci.*"

Part V., Syphilis; Aseptic and Antiseptic Treatment of its External Lesions." The nature of the specific virus of syphilis is said to be unknown. Dr. Gerster, however, finds much resemblance in the anatomical structure of the primary induration of tuberous syphilides, of gummy swellings, and in that of recent tuberculous deposits. Also their course of development and termination in central coagulation necrosis, fatty changes or caseation, he thinks closely resembles the affections caused by the bacillus of tuberculosis. A third analogy of the two diseases, he says, is seen in that their softened foci, as long as they "remain subcutaneous, and are not exposed to the influence of the air and its pus-generating germs, their course is bland and slow, and their tendency is to fatty degeneration, encapsulation, and final absorption. But, as soon as such a softening deposit comes under the influence of the pyogenic elements contained in the atmospheric air, its slow and bland character is changed to a most destructive one." The treatment, therefore, of the primary induration of syphilis is, Dr. Gerster believes, to prevent its ulceration, to be an antiseptic one; since the occluding from the lesion all pyogenic organisms will effectually prevent ulceration. In concluding, he writes, "The foregoing view of the relation of suppuration to syphilitic lesions is based exclusively upon clinical data, and needs corroboration at the hands of pathologists more expert in systematic and exact research than the author."

It is scarcely possible to estimate the valuable addition made to modern surgery by this work of Dr. Gerster from the above brief outline of its contents, and we would desire to impress very urgently upon those engaged in surgical work the importance of reading and learning what has been done and what can be done by a faithful adoption of aseptic and antiseptic surgery. The publishers have done their part of the book in a most excellent manner. Both paper and type are of the best, and the illustrations are numerous. In regard to the latter, we may say, while they add somewhat to the attractiveness of the work, yet many of them could have been omitted without detracting from its value; they show nothing, they teach nothing, but they are perhaps a picture.

J. H. C. S.

OUTLINES OF PRACTICAL PHYSIOLOGY, BEING A MANUAL FOR THE PHYSIOLOGICAL LABORATORY. By William Stirling, M.D.S.C., Professor in the Victoria University, Brackenbury Professor of Physiology and Histology in the Owens College, Manchester. With one hundred and forty-two illustrations.

Philadelphia: P. Blakiston, Son & Co., 1888.

If the matter included in this book of three hundred and odd pages indicates the course followed by the medical students in the author's classes in Owens College in Manchester, we ought to congratulate them on possessing opportunities which we feel sure are not to be found in our most advanced American colleges, and we doubt if similar opportunities are to be met with in any of the other English colleges. It includes a full course on chemical physiology, one hundred pages alone being given up to the consideration of the analysis of the urine, with the study of the food-stuffs, blood, and digestion. In the second part, or experimental physiology, are collected a large number of experiments which may be performed with simple apparatus, and do not involve the infliction of pain upon living animals, and cover all the fundamental facts of nerve and muscle physiology, the circulation, respiration, and central nervous system, and special senses,—all combined into sixty-five lessons. We do not know what is the length of the medical course in the author's college, but it certainly must take more time than that a student even in a four years' course with us would be able to give. We can recommend the book as containing the most recent advances on the subjects, and exhibiting the greatest judgment in the selection of methods and clearness in description.

MANUAL OF PHYSIOLOGY. By G. F. Yeo, M.D., Dublin, F.R.C.S., Professor of Physiology in King's College, London. Third American, from the second English edition.

Philadelphia: P. Blakiston, Son & Co., 1888.

A text-book which in four years can pass through three editions needs no other recommendation. This third edition keeps up the reputation attained by its predecessors, and even may be regarded as improving upon them. While the general arrangement is the same as in the first edition, considerable new matter has been added, and the chapter on the central nervous system rewritten. The illustrations are increased by the addition of a large number of beautiful drawings of the brain and spinal cord. Dr. Yeo's manual has reached the position of being, we believe, the best by far of the smaller text-books on physiology, and while for the advanced student it does not profess to compete with either Foster or Landois, for the beginner it is a safe and reliable guide.

ELEMENTARY MICROSCOPICAL TECHNOLOGY. A MANUAL FOR STUDENTS OF MICROSCOPY. In three parts. Part I. THE TECHNICAL HISTORY OF A SLIDE. By Frank L. James, Ph.D., M.D.

St. Louis Medical and Surgical Journal Company, 1887.

The proper study of animal or vegetable structures by means of the microscope depends entirely upon the manner in which such structures are prepared for examination. In order that a correct description of a tissue may be determined, it is necessary that its examination should be made under circumstances which are as near the natural condition as it is possible to have them; therefore good technical knowledge is the only foundation upon which may be built the structure for a thorough understanding of histology, pathology, or biology. The above work by Dr. James, consisting of one hundred octavo pages, is devoted entirely to elementary technology, and its thoroughness in every detail, from the crude specimen to the finished section upon the slide, ready for microscopic examination, can only be appreciated by those who have had to labor without the assistance of a skilled teacher; indeed, a careful study of the book, and a faithful adherence to the directions given by the author, will render the beginner independent of a teacher. It is certainly a book written by one who has worked for himself and is thoroughly familiar with practical microscopical teaching. To those who are old at microscopic work there is nothing new in the book; but to those beginning the study, they cannot do better than to have the work on their laboratory table; it is full of just such information as they need.

J. H. C. S.

JAHRESBERICHT ÜBER DIE FORTSCHRITTE DER PHARMAKOGNOSIE, PHARMACIE UND TOXIKOLOGIE. Herausgegeben von Dr. Heinrich Beckurts. Neue Folge.

Göttingen: Vandenhoeck & Ruprecht's Verlag, 1887.

We are glad to welcome to our table this publication, which appears to be a thorough review of the literature of the year 1885. It contains much of interest to the therapeutist, but we think it will also be most valuable to the pharmaceutical and toxicological chemist, to whose library indeed it is essential.

Correspondence.

BERLIN.

(From our Special Correspondent.)

It is frequently the case in the medical world that some drug which in the past has been experimented with and recommended, and which after a gradual decline has for many years rested in the storehouse of therapeutics, wellnigh forgotten and entirely out of use, is again brought to light, discussed, and tried by pharmacologists, but only, as is most frequently the case, to be again forgotten and laid aside.

This very likely will be the fate of a remedy that has but recently been attracting the interest of the profession in Germany and elsewhere, and which many years ago had been diligently studied and experimented with; this is erythrophlæine.

Its revival was accidental. Pieces of an African poison, called haya-poison, were sent to Dr. L. Lewin, a Berlin pharmacologist, for examination, and he found it to contain pieces of the bark of the *Erythrophlæum judicale*. This, of course, led him to further experiments, an account of which you will receive from his own pen.*

The report of his experiments, which Dr. Lewin made to the Medical Society of Berlin, naturally awakened the interest of local practitioners, many of whom at once began to experiment with the drug upon man. The results of these are partially in favor of the drug. Schoeler used a two per cent. solution

* See p. 145 of the present number of the THERAPEUTIC GAZETTE.

of erythrophlæine in several cases, and found that, after dropping a few drops of the drug into the eye, the patient experienced a slight sensation of burning and a feeling as if there were some foreign body in the eye, and increased secretion of tears and slight hyperæmia of the conjunctiva. In about five minutes a decrease of the sensibility of the cornea, which could be touched with a probe, and inside of fifteen minutes the corneal anæsthesia was complete, although the sense of touch was not lost. In fifteen or twenty minutes longer all irritative symptoms had disappeared, and only slight hyperæmia remained. In two hours a heaviness of the upper lid and a cloudiness of vision and interference was observed. These symptoms lasted for two or three hours, and then gradually ceased. In nine hours the colored rings had disappeared, but the cloudiness remained for eleven hours. In other cases the duration of the different symptoms varied somewhat. In one case the anæsthesia was complete in five minutes. The average duration of the anæsthesia is from eight to nine hours. The anæsthesia of the conjunctiva was not very great, and in some cases hardly noticeable.

Karewski, assistant in the Jewish Hospital here, used erythrophlæine in numerous minor operations, such as extirpation of the glands, cleaning out of tuberculous granulations, etc. A similar effect was observed as that which follows the use of cocaine, only anæsthesia did not set in nearly so soon, and disagreeable accompanying symptoms, such as local irritation, etc., were frequently observed.

The injection of the drug in neuralgia gave results which will lead to further research and experiment in this line.

The experiences of Liebreich with the drug are very far from satisfactory. He not only contradicts many points of the theoretical conclusions which Dr. Lewin reached, but also cites many cases where its action upon man has not only been unsatisfactory, but also harmful.

Erythrophlæine, he says, is such a dangerous cardiac poison, that it can only be used with extreme caution. Further, its actions, even its anæsthetic properties, are extremely uncertain, and its accompanying symptoms of irritation prohibit it ever occupying a lasting place by the side of cocaine in therapeutics.

Similar results to the above are reported to have been reached in England.

The Society for Internal Medicine (*Verein für Innere Medicin*) has for the last two or three meetings been discussing the therapeutic value of the tincture of strophanthus. Before entering into account of the argument, we will first refer to two former works on the subject. One comes from the Bamberger clinic in Vienna, and refers to eleven cases of Bright's disease and twenty-seven cases of various cardiac and vascular affections which had been treated with strophanthus. The following conclusions may be drawn from this work: that the actions of this remedy upon muscular diseases of the heart are such as can be ascribed to no other drug. Only in one case of advanced degeneration did ill success attend its use.

The remedy was not used with such unparalleled success in valvular affections as in degenerative diseases of the cardiac muscles, but also in three distinct cases of this kind the use of the drug was attended with success. It acted beneficially upon the diuresis and lessened the subjective difficulties.

According to the experiences of the Vienna clinic, the use of the drug is indicated in such cases of valvular trouble where the heart-muscles are incapable of acting with sufficient strength, whether this is due to the commencing of degeneration or to too slight hypertrophy. In cases of chronic nephritis, a good result was only observed to follow the use of the drug where (in seven out of eleven cases) an examination of the pulse showed that the activity of the heart was on the decrease. In such cases an increase of the diuresis always attended its use, which, in some instances, was very considerable.

The results of the experiments made with the drug by Dr. Hochhaus, under the direction of Professor Fürbringer, in the city hospital Friederichshain, in Berlin, are not quite so favorable. The drug was tried upon sixty different patients, among which five were healthy, ten suffering with valvular troubles, eighteen with chronic degeneration of the cardiac muscles unattended by valvular complications, nineteen cases of kidney-affections, and eight cases of other cardiac troubles which do not fall under the above-named heads. In certain cases of valvular affection, when there existed difficulties of compensation, strophanthus tincture proved to be an invaluable remedy; it decreased, regulated, and strengthened the heart's action. The first-named effect took place at once; the last, however, not for several days later.

Dyspnœa and œdema were promptly relieved. However, these beneficial actions did not by any means take place with the regularity and certainty of digitalis. In the majority

of cases in which strophanthus tincture had been given without avail, digitalis proved to be efficacious; on the other hand, it was but very rarely that strophanthus proved itself to be of value where digitalis had failed. As a rule, the action of digitalis was always prompter and more thorough than that of strophanthus, especially on diuresis. Strophanthus tincture seemed, however, to exert a more beneficial action in respiratory complications. Such complications may, therefore, be viewed as special indications for the use of strophanthus in valvular disorders, and here it may be used in preference to digitalis. It is, however, almost impossible to pick out cases in which the drug will act with any degree of certainty.

In chronic degeneration of the heart's muscle, usually accompanied by a thready, frequent, and irregular pulse, severe dyspnœa, and œdema the drug usually acted with promptness and comparative certainty.

The dyspnœa was conquered by it sooner than anything else, and later its regulatory and strengthening properties became apparent. In acute and chronic inflammation of the kidneys the actions of the drug were not very marked; the dyspnœa only was frequently relieved without its causing any improvement of the diuresis or œdema. In cases of palpitation and vertigo of a nervous origin strophanthus was given with marked success.

Œdema of a cachectic origin likewise improved under its use.

An accompanying effect of the drug was noticed upon the digestive system. Its use frequently caused a feeling of repugnance to the drug and nausea, which, if the use of the drug was still continued, resulted in retching, vomiting, and sometimes even in severe diarrhœa. Usually the disagreeable symptoms did not go further than repugnance and nausea, and then the stomach became accustomed to the drug, and its use could be continued.

As to the proper dose, the following method proved to be the best: Three times daily doses of 6 drops of the tincture in a tablespoonful of water or wine, corrected, if necessary, by syrup of liquorice. The dose should be increased by two drops every day, until its action is noticeable. This last dose should then be continued for a few days longer.

Larger doses than 20 drops three times daily are not advisable. With children, the dose should be only 3 drops, given three times a day, and, at the highest, should not be increased to over 5 drops thrice daily.

Usually the action of the drug was first noticed on the second or third day, and continued for one or two weeks, but the duration of the effects caused by it was always uncertain. No cumulative action was observed.

The results of further experiments with the drug were reported by Professor A. Fraenkel. He treated twenty patients with the drug, among which were twelve cases of valvular affection, three of arterial sclerosis, and he has arrived at the following conclusions regarding its value. Strophanthus tincture is an active cardiac tonic, which is in nowise more active than digitalis. In certain cases, however, it can ably take its place.

Although several cases were observed where, after strophanthus tincture had failed to produce the desired effect, digitalis was given, and it acted with its accustomed regularity and promptness upon the pressure of blood, diuresis, and subjective difficulties; but never was there a case observed where, after the failure of digitalis, strophanthus tincture was of any avail.

In a number of cases where strophanthus had a marked effect upon the pressure and diuresis, after a continued use of the drug, these symptoms were gradually noticed to decrease.

This shows that as the system gradually gets accustomed to the drug it also gets blunted to its effects. This was especially noticeable in cases of valvular failure. The best results seemed to follow the use of the drug in cases of functional disturbance of the heart's activity, resulting from the misuse of tobacco and alcohol, and from overexertion, whereas, in cases of valvular failure, its effect was more moderate, and in patients suffering from chronic nephritis and arterio-sclerosis a directly negative action was observed.

Under certain circumstances the drug also acted beneficially in cases of renal disturbances on account of its effect upon the pressure of blood and diuresis, and therefore was active in relieving ascites.

No beneficial action upon dyspnœic patients was observed, with the exception of what was caused by the drug's actions upon the pressure of blood and diuresis.

Disagreeable accompanying symptoms, such as dyspeptic troubles, were but seldom observed. The action of the drug began usually in about twenty-four hours, but sometimes even later. As to the dose, Fraenkel advises the treatment to begin with 5-drop doses, given three times daily, and to be increased to 10 to 15 drops three times a day.

The drug has been also tried in the Moabit

Hospital of this city by Dr. P. Guttmann. Dr. Guttmann brings a report of thirty different cases where he has used the drug, comprising thirteen of valvular failure, five of chronic myocarditis, two of idiopathic cardiac hypertrophy, one of Basedow's disease, two of chronic nephritis, two of emphysema of the lungs, one of pleuritic exsudation, two of ascites in cirrhosis of the liver, and two of phthisis.

Guttmann considers strophanthus to be valuable in many cases, but in nowise is it able to take the place of digitalis. Proportionately, strophanthus was less active with reference to its properties of increasing and strengthening the heart's activity.

In only a few cases out of the thirteen which were affected with valvular failure did strophanthus exert an action which was repeatedly obtained by digitalis in the same cases. Out of the five cases of chronic myocarditis in only one was the use of the drug attended by regulation and strengthening of the pulse.

The best results of the remedy were observed in diuresis. In some cases also the drug acted favorably when a dyspnœic condition supervened. In both cases of nephritis, strophanthus had little or no effect upon the diuresis.

Since the above experiments were made, Dr. Fürbringer has received from Hochhaus a report of sixty other cases in which the drug had been given, and these speak even less favorably for the drug than the former experiments.

The entire number of cases treated with the drug by Hochhaus were one hundred and twenty, and out of these there were only thirty cases in which the use of the remedy was attended by an undeniably favorable result. In this last report the action of the drug upon the dyspnœic condition was especially unfavorable. Out of the one hundred and twenty cases three sudden deaths followed its use, the cause of which could not be clearly determined by an autopsy. If, in such affections, sudden death is likely to or possibly can spontaneously occur, it is a warning for us to be most careful in using the drug.

No other than Fraser has lately advised great caution in the administration of the remedy.

All these reports differ very decidedly from those which appeared at first, and which praised strophanthus so highly, and attributed to it such remarkable properties, the results of which were said to have been realized. Although the observations of the different German physicians differ from each other in minor points, yet they agree in the main. Their difference is most likely largely due to the great difference of the various preparations of the drug, which come into commerce under the name of strophanthus tincture. Perhaps this could be avoided by using the active principle contained in the strophanthus seeds instead of the tincture.

It has recently, however, been strongly doubted that the strophanthus which Fraser has found is a pure preparation.

PARIS.

(From our Special Correspondent.)

Dr. Brouardel, the president of the Paris Faculty of Medicine, has just issued his yearly official report, from which the following data are gathered. The total number of students during the last annual session was 3667, against 3696 for the preceding. But the slight difference (29) is owing to a more rigid enforcement of the admission rules, especially as regards female foreign students. During the session 582 new students matriculated, consisting of 379 French and 103 foreign applicants. Of the foreigners, 89 were males and 11 females. As their nationality is of some interest, it may be noticed that the Russians head the list with 30, 10 of whom are women; Americans come next with 20, all men; Turkey and Roumania sent 11 each, only men also; England, Italy, and Servia, 5 men each. Not to waste time on countries with a still smaller representation, suffice to say that of the new-comers one only is German, and he, most likely, an Alsatian. Yet, not to slight the fair sex, it must be added that the eleventh female student unaccounted for above is a Greek. To complete the description, it is necessary to speak of the diplomas conferred, which amounted to 357 in all,—311 to French and 46 to foreign students. Of the foreign graduates, 42 were men, consisting of 9 Roumanians, 7 Americans and as many Turks, 6 Russians, 3 Englishmen and as many Spaniards and Swiss, with 2 Greeks, and 1 German keeping company to 1 melancholy Dane. The 4 lady graduates were 2 Americans, 1 Roumanian, and 1 Russian. It may be of some interest to place now in juxtaposition a brief account of the Paris College of Pharmacy during the same period. According to official data,

1704 students were on the roll, 641 of them serving time under practising pharmacists, 593 attending the lectures, and 470 undergoing various examinations. The foreign students numbered 23,—namely, 6 Russians; 5 Turks; Greeks, Roumanians, and Servians, 2 each; with 1 each from Hayti, Mexico, Chili, Mauritius, Spanish West Indies, and Switzerland. It will be noticed that the United States and England were unrepresented. The reason is, that no one can matriculate unless he holds the baccalaureate degree, or some college diploma proving the applicant to have received a liberal education. In fact, the preliminary conditions are just the same as for the Faculty of Medicine. Well, when American or English young men are thus qualified, they leave pharmacy alone, because, although it be considered a profession on the continent, it is not in their own countries. The number of pharmacy diplomas conferred during the session ending in November, 1887, was 138,—104 of the first class and 34 of the second. There were no female students. No law or custom prevents them from matriculating and graduating, but somehow they do not take to pharmacy. They prefer either medicine or herboristery, for the latter of which 59 diplomas were conferred by the College of Pharmacy, mostly to women.

Dr. Pouchet is now investigating the therapeutic properties of new mercuric and mercurous combinations, which he has obtained and tried on animals in large doses as a precaution. One series of the compounds is formed from one molecule of phenol-mercury combined with one molecule of calomel and four of water, naphthol or anthrol. The other series is obtained by substituting the radicals phenyl or naphthyl for one atom of chlorine in corrosive sublimate; mercuric phenyl-chloride and mercuric naphthyl-chloride are the names of such combinations. From the composition of the new salts favorable results may be anticipated in intra-muscular injections according to Scarenzio's method, and whenever intestinal antisepsis is desired. The experiments made on animals have shown the phenol-mercury combinations to act slowly and mildly, the decomposition in the economy taking place gradually, while the antiseptic agents set free at the same time have a favorable influence on the general effects. Working formulas for the new compounds have not yet been published, but they may be soon expected to be, as Dr. Pouchet is a candidate for a seat in the Academy of Medicine.

Nickel has recently been proved to be harmless as a metal, and therefore well adapted to most domestic and pharmaceutical uses. Nickel-plated vases and utensils are consequently allowable also, but with the *proviso* that the coating be perfect and of sufficient thickness. Such is not the case, it seems, with a new style of metallic cans now employed by wholesale dealers and manufacturers in France. The vases in question, rather attractive in appearance, consist of sheet-zinc plated with nickel. Either the inside, however, has no coating, or the coat is insufficient, as all acid liquids therein contained are found contaminated with zinc. An instance in point, interesting medicine and pharmacy, has just been noticed in French papers. Orange-flower water, which had been left only forty-eight hours in a metallic can of this description, was found to be so impure from the presence of zinc as to be unfit for use. Orange-flower water, like most distilled waters, is well known to be always more or less acid, and American buyers of the product are advised to be cautious when it is offered in nickel-plated packages.

The fauna of graveyards may not be as nice a subject as orange-flower water; but although hyenas and coyotes are here out of question, it is a fauna of some importance for several reasons. While in company with Dr. Brouardel, who was last winter superintending exhumations at the Ivry Cemetery, Dr. P. Mégnin, of the French Medico-Legal Society, made some rather interesting observations. Dr. Brouardel had only sanitation in view, but his associate paid attention also to the entomological side of the question, and collected a number of useful facts and data, besides curious specimens. To begin with, a disputed point has been settled. According to popular opinion, corpses are eaten up by worms, self-generated, of course. Scientists, on the other hand, knowing that worms must be the offspring of some organized insect, and concluding six feet of earth to be obstacle enough, were inclined to the biblical conception that man shall return to dust. But actual observation has proved popular belief to be right, in our region at least. The bodies exhumed from the Ivry Cemetery, a considerable burying-ground just south of the Paris city limits, had been buried at different dates, well known, and varying from two to three years, and on every one of them an ample collection of the larvæ, nympha-shells, and perfect beetles of various species of insects were collected. After identifying the

creatures, it was observed that while the number of individual insects feeding on corpses under-ground is very large, the varieties of species are fewer than are noticed in open air. Some, besides, peculiar to graveyards, were hitherto scarcely known, and have strange habits unsuspected by entomologists. The following are the names of the specimens collected: Dipteræ, four species,—viz., the *Calliphora vomitoria*, *Curtonevra stabulans*, *Phora aterrima*, and an undetermined *Ontomyia;* one Coleopter, the *Rhizophagus parallelocollis;* and two Thysanouræ, the *Achorutes armatus* and *Templetonia nitida*. But the important point noted was that the different species had come and developed successively, the Calliphoræ and Curtonevræ having been first at work, and being totally absent from bodies buried during winter. The Anthomyiæ, who had come next, then the Phoræ, and finally the Rhizophagi, which were found full of life on bodies buried two years before. Another detail is, that the Phoras prefer lean corpses, while Rhizophagi are always found near fat bodies. The importance of such observations in medico-legal cases may sometimes be very great, as they may enable experts to determine at what season of the year a hidden corpse has been buried, and approximately how long it has been under-ground. Another question interesting entomologists is, How can beetles and flies thus reach bodies enclosed within coffins? For those insects setting first to work the answer is easy. The eggs were deposited in the mouth, ears, and nostrils before burial. For the other species an explanation is more difficult, since either the larva or the insect must burrow through considerable thickness of ground. Dr. Mégnin's opinion is that the larva does it, earthworm-like, but no proof has been offered.

The *yellow fever* blood microbe has met with a defeat, so to speak, as its existence is now denied, if not conclusively disproved. Last year, Dr. Domingos Freire, of the Rio Janeiro Faculty of Medicine, being in Paris, sent in March a communication to the Academy of Sciences, announcing he had discovered in the blood a microbe peculiar to yellow fever. Dr. Paul Gibier, of Paris, who had been in communication with Dr. Freire at the time, and aided him in his work, was subsequently sent by the French government to Havana to study yellow fever on its selected ground, and find, if possible, some prophylactic against the disease. The results of Dr. Gibier's investigations were communicated by him, on February 13, to the Academy of Sciences, his letter being sent from Havana direct. His conclusions, he regretted to say, are in utter contradiction with Dr. Freire's theories. No microbes could be found in the blood or urine of patients who had died from yellow fever. None could either be detected in the pericardiac liquid, bile, or in any of the viscera, with the exception of the intestines. But when the vomited matters and the contents of the intestines were examined and analyzed, microbes of all shapes and all species were observed in considerable quantities. Experiments made on animals with the black matters—they are so characteristic of the disease that it is often called the black vomit, *vomito negro*—showed animals to be easily poisoned with the toxic principles therein contained, and secreted by the micro-organisms in question. But Dr. Gibier, who is of the Pasteur school, was not yet satisfied. He isolated from the black matters of the intestines a micro-organism, cultivated it in a suitable medium, and found one drop of the liquor to be sufficient to kill guinea-pigs some twelve or sixteen hours after having been injected into their small intestines. The symptoms were congestion of the bowels, with formation of sanguinolent black matters. Whether the organisms in question are the cause or the effect of the vomito is a point to be elucidated in a future communication; but the conclusion forces itself on us that yellow fever is not properly a fever, but a poisoning of the economy by a specific fermentation taking place in the intestines exclusively. The fever is most likely a concomitant only, common to nearly all acute poisonings. The same is true with albuminuria.

PARIS, February 22, 1888.

CARBOLATE OF CAMPHOR.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—While perusing the pages of the THERAPEUTIC GAZETTE, December 15, 1887, an article on "Carbolate of Camphor," written by Dr. M. B. Cochran, attracted my attention. The undersigned, you will please observe, described, a few years ago, the identical substance, but under a different name, in the *Boston Medical and Surgical Journal*, January 8, 1885, and in the *Medical and Surgical Reporter*, Philadelphia, Pa., February 7, 1885. An abstract appeared also in the *Deutsch-Amerikanische Apotheker-Zeitung*, New York City, January 15, 1885. On reading these journals you will see that I ex-

perimented with the substance alluded to as far back as the *year 1882*. Reasoning from certain chemical principles, I called the compound "Phenol Camphor." The article of Dr. M. B. Cochran is a happy revival of this interesting therapeutic agent, and credit is due to him for bringing it again before the medical profession.

Very respectfully yours,

THEODORE SCHAEFER, M.D.

MILWAUKEE, WIS., March 2, 1888.

Notes and Queries.

PURE NARCEINE.

Some time since, in a communication upon the halogenalkyl addition products of narceine (*Ber.*, xviii. 1575), MESSRS. CLAUS and RITZEFELD mentioned incidentally a product, melting at 162° C., which they supposed to be a new base, formed by the limited oxidation of commercial narceine with potassium permanganate. A more careful examination of this substance, however, by Messrs. Claus and Meixner (*Journ. f. Prakt. Chemie*, xxxvii. 1) has shown that it is actually pure narceine, and that commercial preparations having the melting-point 145° C. evidently contain small quantities of other substances, which in the limited oxidation with potassium permanganate are the first to undergo decomposition. Messrs. Claus and Meixner state that if commercial narceine be treated with nearly an equal quantity of potassium permanganate and the quantity of dilute sulphuric acid required for the decomposition, the pure alkaloid can be obtained with certainty, though with some loss. The alkaloid thus obtained has all the characters attributed to narceine, with the exception of the melting-point, which is 162° C. It dissolves freely in hot water and in alcohol, with difficulty in cold water and in chloroform, and is almost insoluble in ether and benzol. From hot water it crystallizes in small colorless needles, having the composition represented by the formula $C_{23}H_{29}NO_9$. Narceine, when pure, is readily decomposed by potassium permanganate, and in this way a beautifully crystalline acid was obtained, having the composition $C_{15}H_{15}NO_8 + 3H_2O$, which has been named "narceinic acid." This acid appears to be a derivative of naphthalic acid, and from a consideration of this and other decompositions the authors conclude that narceine stands in near relation to naphthalene. The foregoing statement as to pure narceine appears to have special pharmaceutical and therapeutical interest in the light of the experience of M. Laborde (*Pharm. Journ.* (3), xvii. 882), who obtained with narceine that had been specially purified from morphine and codeine results superior to those following the administration of the ordinary commercial compound. — *Pharm. Journ. and Trans.*, January 28, 1888.

ULEXINE.

This alkaloid, prepared from the common gorse by Mr. Gerrard, has been experimentally studied by MR. J. ROSE BRADFORD. Ulexine has a very general action on the tissues, and, besides, a highly specialized action on the respiration. Pinet has also worked at the subject. Both in the frog and eel ulexine paralyzes the vagus and the motor nerves somewhat in the same manner as curare. On the respiration of the frog ulexine acts altogether unlike curare; in doses which only cause a slight and transient paralysis on voluntary movement it has a profound action on the respiration. Ulexine is a powerful respiratory poison in the mammal also. In frogs and cats, muscular twitchings were observed, and, curiously enough, they persist after the part in which they are present has been completely severed from the body. These muscular movements are not seen after large doses, and not in curarized animals. They are the effect of small and initial doses. The muscles also respond to mechanical excitation much more readily than normally after the injection of small doses. The drug acts first as a stimulant and then as a depressor of the respiratory mechanism, and in larger doses paralyzes the motor nerves of mammals; but this effect is preceded by a period during which the excitability of the voluntary muscles is increased and quivering movements are produced, apparently of peripheral origin. Ulexine raises the blood-pressure both in curarized anæsthetized animals and in non-curarized animals. Mr. Rose Bradford finds that this elevation of pressure is observed even after the section below the medulla (in dogs). Although large doses paralyze the heart, yet the drug will not kill through the heart for a considerable time if artificial respiration be maintained. Ulexine has a powerful effect on the kidney, causing constriction, followed by a very large expansion of short duration. The physiological effects point to a possible di-

uretic action, and this is what really happens. It has been employed in University College Hospital as a diuretic with success in cases of dropsy due to heart-disease.—*Lancet*, February 4, 1888.

COCAINE IN WHOOPING-COUGH.

Dr. Weintraub, of Eydknhnen, has used cocaine with remarkably good results in cases of whooping-cough, where other remedies and expectorants had failed.

He prescribes the following formula:

℞ Cocain. muriat., .2 gramme (gr. iii);
Aqu. amygd. amar., 10 grammes (ʒiiss).
S.—10 to 15 drops, to be given several times daily.

So soon as this treatment was commenced the paroxysms of coughing became less intense, vomiting ceased entirely, and in about two weeks the disease had disappeared. Four children were treated, who were about three years of age, and the result of the treatment was equally satisfactory in every case. No symptoms of intoxication or poisoning were observed.—*Alg. Med. Central Ztg.*, 91, 1887.

COMPOSITION OF SOZOIODOL.

A communication upon the iodphenolsulphonic acids from Herr Kehrmann (*Journ. f. Prakt. Chemie*, xxxvii. 9) appears to have an interesting and suggestive application to one of the most recently-introduced antiseptics, to which reference was made last month (p. 538) under the name "sozoiodol." According to a specification for a patent, quoted by the author, when phenolsulphonic acids or their salts are treated with an equivalent quantity of iodine there occurs after a short time a separation of a mixture of iodized sulphonic acids. When potassium paraphenolsulphonate is used, the first to crystallize out, in very fine colorless prismatic needles, is an iodparaphenolsulphonic acid, difficultly soluble in water; afterwards, upon gentle evaporation of the filtrate, scales of an iodophenolparasulphonic acid separate. These two compounds are said to have been exhibited at the Wiesbaden meeting of German naturalists and physicians as "Sozoiodol I. and II.," and "sozoiodol" was brought before the Dermatological Section of that meeting by Dr. Lassar, who is reported as representing it to be monoiodparaphenolsulphonic acid, having a composition corresponding to the formula $C_6H_3.I.OH.SO_3$, and containing forty-two per cent. of iodine. It will be remembered, however, that, as mentioned last month, it was subsequently authoritatively stated that sozoiodol, as sent out, does not consist of a free acid, but is an acid sodium salt of iodolparaphenolsulphonic acid. In the communication just published, Herr Kehrmann denies that the "difficultly soluble sozoiodol No. I. is altogether a monoiodparaphenolsulphonic acid," or that "forty-two per cent." correctly represents the amount of iodine that it contains. In fact, he states that in treating potassium paraphenolsulphate (one molecule) in acid solution with iodine (one atom) in a manner described he obtained long prismatic crystals, which in appearance and characters were identical with "sozoiodol No. I., difficultly soluble," but which really consisted of the primary potassium salt of a diiodophenolsulphonic acid," represented by the formula $C_6I_2H_3KSO_4+2H_2O$, the anhydrous salt yielding 54.74 per cent. of iodine. It would appear, therefore, that further information is desirable as to the composition of the substance now sent into commerce under the name "sozoiodol."—*Pharm. Journ. and Trans.*, January 28, 1888.

A SALVE FOR CHILBLAIN.

Dr. Lassar recommends the following salve as very efficacious in chilblain:

℞ Acid. phenic., gr. xvss;
Ung. plombi,
Lanolini, aa ʒv;
Ol. amygdal., ʒiiss;
Ol. lavand., gtt. xx.

—*Journal de Méd. de Paris.*

THE SALIVA AND GASTRIC DIGESTION.

G. Sticker (*Volkmann's Samml.*, 297; abstr. in *Fortschr. d. Med.*, 1888, No. 2) concludes from his observations that the notion that the salivary secretion plays no part in gastric digestion is erroneous; that, on the contrary, the presence of saliva in the stomach has a direct effect in promoting the secretion of gastric juice. The deduction was made from a case which presented a marked deficiency in the salivary secretion, and in which an examination of the contents of the stomach proved that the gastric juice was diminished in quantity, and proteolysis impaired. By administration of jaborandi the saliva was increased in amount and the digestive powers restored. Since it is not known that this drug has any effect upon the

secretion of gastric juice, it was inferred that the restoration of the latter was due to the entrance of saliva into the stomach. A simple experiment seemed to bear this out. The white of three eggs was introduced into the stomach of a man, and the contents of the viscus withdrawn at the end of two hours. On one occasion he was forbidden to swallow saliva, and on another allowed to do so. It was found that in the first case the stomach still contained intact albumen as well as undigested starch, and the gastric juice yielded a very feeble peptonizing power, while in the second digestion had been entirely effected. That this result is not due to an assumed increase in peptogenic substances in the blood by the conversion of starch into dextrin, but to the direct influence of the saliva, was shown by withholding starch in the above experiment, when it was shown that albumen was normally digested so long as saliva was suffered to pass into the stomach.—*Lancet*, February 4, 1888.

THE THERAPEUTICS OF HEADACHE.

As long as headache or "megrim" (hemicrania) was considered to be an affection of the sympathicus, its treatment was naturally a treatment of that nerve, principally by means of electro-therapeutics.

However, the wished-for results that had been based on this theory were never realized. Erb denies the theory that megrim is a "neurosis of the sympathicus." Eulenburg, Moebus, and many others also are of a like opinion.

Therapeutically salicylic acid, antipyrin, and other remedies have been used with success in attacks of headache, but at the best they only serve to ease the pain or lessen its intensity.

A vast number of theories and "specifics" have been brought forward, the value of which has never been such as could be wished for.

Recently in France good results were reported to have followed the practice of so-called "vibration," which was done either with the fingers of the physician or by means of a quickly-vibrating instrument. Eulenburg was treating a lady for obesity and slight fatty degeneration of the heart by means of Oertel's method. The patient recovered, and at the same time was found to be cured from headache of the severest type, from which she had long been a sufferer.

Generally it is, however, impossible to apply Oertel's method to all sufferers from headache. But there are other methods of treatment which may be practised on any patient, —viz., hydro-therapeutics and balneo-therapeutics. It has been well known for some time that a careful course of bathing often has a most beneficial effect on headaches.

Dr. Pelizaeus, in an article which appeared in the *Deutsche Med. Zeitung*, 1887, 66, strongly advocates the "water-cure in cases of megrim." In many cases he claims to have effected a complete cure in six to eight weeks.

Any minute directions cannot be given, as the treatment is not one of any certain disease, but is merely a general treatment of the patient.

In private practice the mode of procedure must be as simple as possible, so as to avoid the possibility of technical mistakes. As important as the bath itself is the treatment before and after the bath. Before bathing, and especially before taking a cool bath, the patient should carefully abstain from any fatiguing mental or physical work; should also never bathe when coming from a meal; must not be cold or chilly. After a warm bath rest is necessary, and after a cold one the patient should either walk until tired or, if that be impracticable, should practise gymnastics or other bodily movements.

In one case mentioned by Dr. Pelizaeus the treatment consisted of a daily half-bath of 23° R., which temperature was gradually reduced to 18° R. The patient remained in the bath from two to four minutes. In the afternoon a cool hip-bath was given, the temperature of which was from 20° to 25° R., which lasted from ten to fifteen minutes. After a few days the patient took a sponge-bath in the mornings.

This treatment was accompanied with nourishing food and plenty of out-door exercise. During the six weeks of treatment the patient had slight attacks of headache three times in the evening, but easily slept them off and awoke in a few hours perfectly free from pain. After four weeks the morning sponge-bath was discontinued, and the patient was wrapped in wet sheets for an hour to an hour and a half, after which he was rubbed down with cold water.

In six weeks a complete cure had been effected, and when the patient was last heard from, which was two years and a half after the treatment, there had still been no return of the headache.

REACTIONS OF NAPHTHOL.

The French pharmacist DESESQUELLE reports the following in the *Archives de Pharmacie*, 387, 1887:

Naphthol dissolves in 5000 parts of distilled water, at a temperature of 18° C. It is also slightly soluble in glycerin and in fluid vaseline.

REACTIONS.

1. Hydroxyde of potassium and hydroxyde of sodium, and certain alkali salts, when added to a watery solution of β-naphthol, give it a violet fluorescence like ammonia; the addition of acids causes this fluorescence to disappear.

2. Chloride of calcium in solution will give a yellowish color to the naphthol solution. The chloride of calcium must be added drop by drop, as an excess will cause a disappearance of the coloration.

3. A mixture of concentrated sulphuric acid and nitric acid will give a beautiful red color to the solution, which sets in a few moments after the acids have been added, and gradually becomes more intense, then grows darker, until it assumes a deep violet-red color. Upon the addition of an alkali this coloring will disappear and the solution will become yellow.

4. Fuming nitric acid gives a red coloring, which gradually changes into yellow.

5. Hypobromide of sodium causes the solution of naphthol to assume a yellow color similar to that caused by chloride of calcium; this also will disappear if an excess of the hypobromide be added.

6. Bromuretted water and chloruretted water cause a white precipitation. β-naphthol frequently has a slightly red coloration, which is constant in the alcoholic solution.

INSECT STINGS.

DR. BERNBECK, in the *Vereinsblatt der Pfälzer Aerzte*, No. 6, advises the following applications for insect stings or bites:

1. ℞ Collod. elast., 19 (℥v);
Acid. salicyl., 1 (15½ gr.).
S.—To be applied to the sting.

2. ℞ Collod. elast., 10 (℥iiiss);
Hydrarg. bichlorat. corrosiv., .01 (⅙ gr.).
S.—As above.

Both of the above lotions are equally good, so that ammonia need no longer be used in such cases. As soon as the lotion is applied the pain and irritation ceases, and only rarely did the surrounding skin become swollen in consequence of the sting,—that is, when the remedy was immediately applied.

MANAGEMENT OF CHILDREN'S TEETH.

PROFESSOR MILLER, of Berlin, in an article on the "Milk-Teeth," published in the *Therapeutische Monatschrift* (No. 2, 1888), points out the evil effects of sugar and other substances which undergo fermentation changes. A child, he says, is constantly eating sugar and substances containing it, and though the particles of food are more apt to get between the teeth and to set up caries than in the case of grown persons, children never, or at least rarely, have their teeth cleaned. This is a process which he would insist upon, a very soft brush and a weak disinfecting dentifrice being employed for the purpose. He would have it done twice daily. Sweetmeats should, he thinks, be entirely prohibited, or their use very carefully supervised. Barley-sugar he does not consider so injurious as chocolate and soft clammy sweets, for whereas these latter will break up, and particles of them may remain for hours between the teeth, such a substance as barley-sugar is readily soluble, and therefore it is soon carried away into the stomach with the saliva. It must be remembered, too, that starchy substances soon become converted into grape-sugar. Professor Miller suggests that after a child has eaten the barley-sugar allowed him its mouth should be washed out with water. When the teeth have become decayed they should at once be stopped, even in the case of children under three years of age. All children's teeth should be, he considers, regularly attended to from the very beginning. We fully concur with the recommendation of Dr. Miller that children's teeth ought to be cleaned, and that the fermentation of sugar is a potent exciting cause of caries, but we dissent from him as regards the prohibition entirely of sweetmeats. Sugar is a part of the natural food of children; there is a universal craving for sweets among the juveniles of all nationalities, and the percentage of those having a distaste is almost infinitesimal. If sweets are to be denied, to follow the argument to its logical conclusion, fruit ought to be prohibited, because it has been shown by Magitot, Tomes, and others that citric and malic acid are quite as destructive to teeth as sugar fermentation.—*Lancet*, February 11, 1888.

A CASE OF DIABETES MELLITUS.

DR. W. D. HAMAKER reports the following case:

"Soon after reading the article in the GAZETTE on the 'lithiated arsenical' treatment of diabetes mellitus, the following case occurred in my practice:

"E. H., female, white, æt. 15 years, consulted me November 7, 1887, with the following history: She had the ordinary diseases of childhood; had had scarlet fever when two years old. No history of rheumatism nor of any fright or shock. She began to menstruate in June last; menses scanty and pale. No disease could be discovered on the father's or mother's side, except that one aunt had chorea.

"In July she began to fail in health, and about two months before coming to me she began to have a ravenous appetite, with loss of flesh, great thirst, and increased amount of urine. These increased rapidly, and November 7 she presented great emaciation, pale skin, dry, fissured tongue, and hay-like odor of breath.

"*November* 8.—She weighed eighty-seven pounds, and the amount of urine in twenty-four hours was thirty-six pints, with a specific gravity of 1028, and giving a strong reaction with Fehling's solution. She was also troubled with pruritus vulvæ. I put her on $\frac{1}{24}$ grain of strychnine and 3 grains of ergotin t. d., and a strict diabetic diet.

"*November* 14.—Urine diminished to twelve pints in twenty-four hours, with specific gravity of 1026. Was able to keep her on the diet very easily. Thirst was much diminished.

"*November* 21.—Put her on 3 grains of carbonate of lithium and $\frac{1}{10}$ grain of arseniate of sodium per diem, dissolved in a quart of water. This to be drunk at meal-time. No other medicine was given, and the diet was continued as before. Not much liquid allowed, except a couple glasses of milk and the water taken with the medicine.

"*November* 28.—Amount of urine per diem, eleven to twelve pints in the past week; weight, eighty-six pounds; feels much better; thirst not marked; no pruritus. A large alveolar abscess opened to-day. General appearance of patient much improved.

"*November* 29.—Last night was the first night in which she was not compelled to rise to urinate.

"*December* 1.—Weight, 87 pounds.

"*December* 3.—Arseniate of soda continued at $\frac{1}{10}$ grain per diem, but the lithium carbonate increased to 12 grains per diem.

"*December* 8.—Medicine and diet continued as before. Patient feels better and looks better; drinks very little.

"*December* 13.—Reduced liquids to one pint of water with the medicine. Allowed no tea, coffee, apples, or oranges, and as little water or milk as possible; weight, eighty-seven pounds.

"*December* 20.—Strong and bright; specific gravity of urine, 1028. From November 28 to present date the amount daily has been from nine to twelve pints.

"*Dec.* 24.—Quantitative analysis showed twenty-two grains of sugar to the ounce. This was the only quantitative analysis made.

"*January* 2.—Weight, eighty-seven pounds; specific gravity, 1022; general health improving. Patient has adhered strictly to diet, and the treatment continued as before. A small piece of well-done toast was allowed twice a day, but immediately the urine increased in amount. The toast was stopped at once.

"*January* 8.—The daily amount of urine continues at ten to twelve pints; specific gravity, 1022. Apparently she was doing as well as before.

"I did not see the patient again till January 16, when I found her almost comatose, with labored breathing; tongue and lips dry and parched; some pain in the chest and great deafness; specific gravity of urine, 1015; and strong reaction was shown on testing for acetone. Death ensued the following day.

"In this case the new treatment was faithfully carried out in every detail for eight weeks, and until one week before her death there was apparent improvement; but the sudden change, the onset of coma, the presence of acetone, and the other symptoms showed no difference from the termination of cases treated by the older methods.

"My next case I shall treat the same way, for we should give a fair trial, in so intractable a disease, to any method which promises to be successful in even a few cases."

MEADVILLE, PA., February 25, 1888.

FORMULA FOR COCAINE SALVE.

℞ Cocaine oleat., .40 to 1 gramme (gr. vii to xvss);
Lanolini, 18 grammes (℥v);
Ol. oliv., 2 grammes (gr. xxxi).

To be used several times a day in cases of anal or vulval pruriency or upon painful herpes.

—*Gazette Hebdomadaire des Sciences Médicale*, Montpellier, January 14, 1888.